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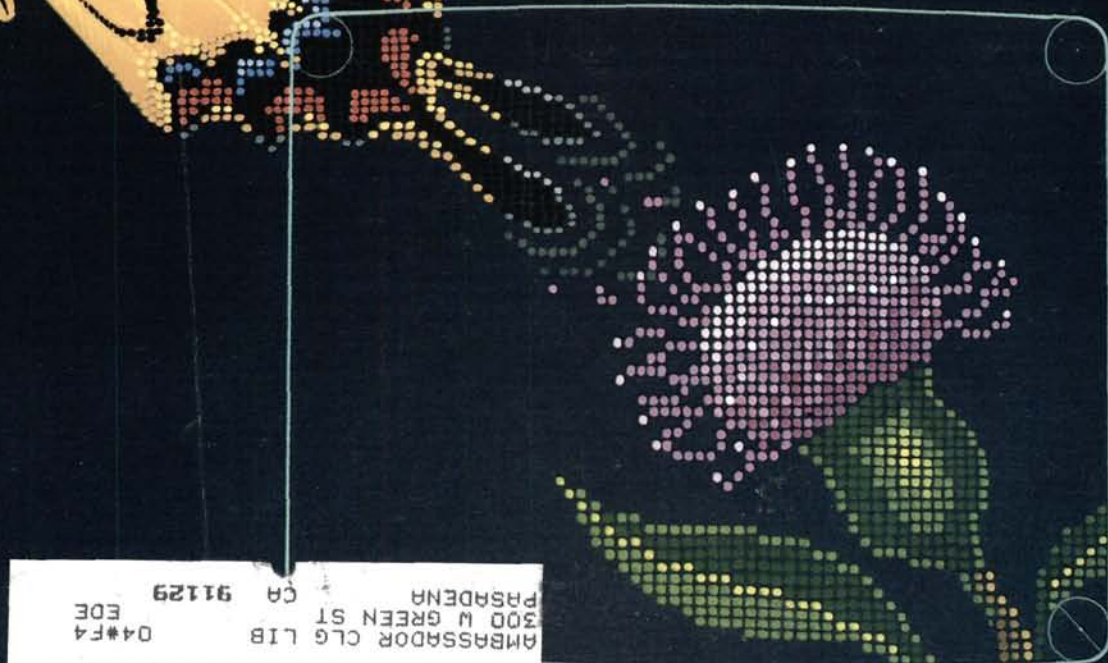
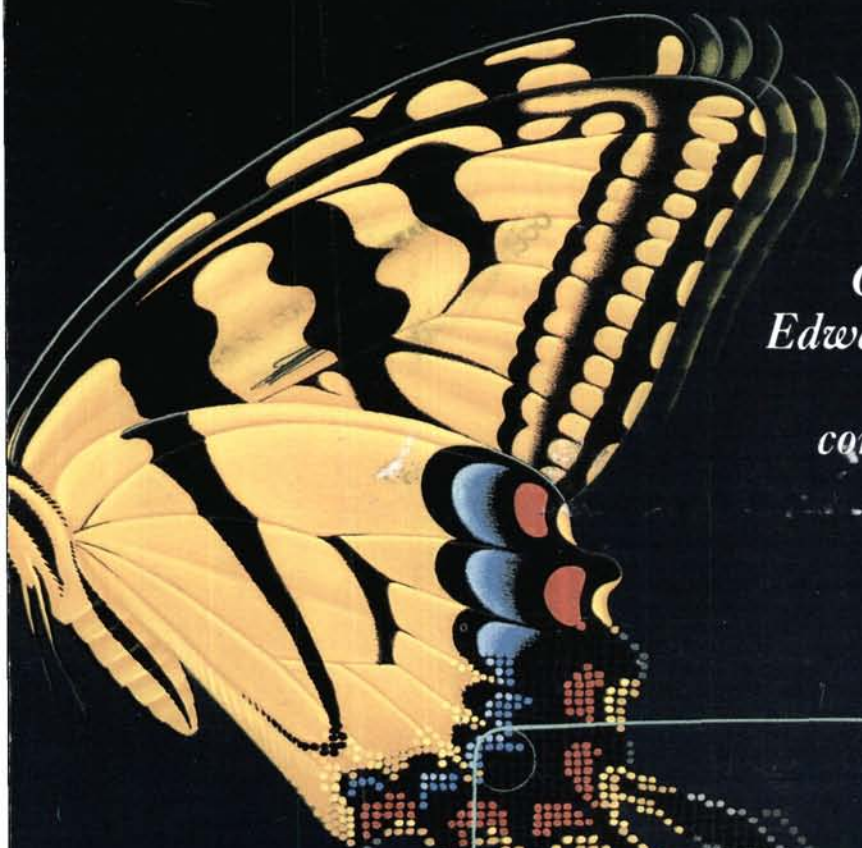
The Atlantic

A SLUM IN TOKYO / WHAT'S HAPPENED TO AMERICAN HIGH SCHOOLS

Did the Universe Just Happen?

*Controversial scientist
Edward Fredkin says no—
that the universe is a
computer, and was built
for a purpose*

By Robert Wright



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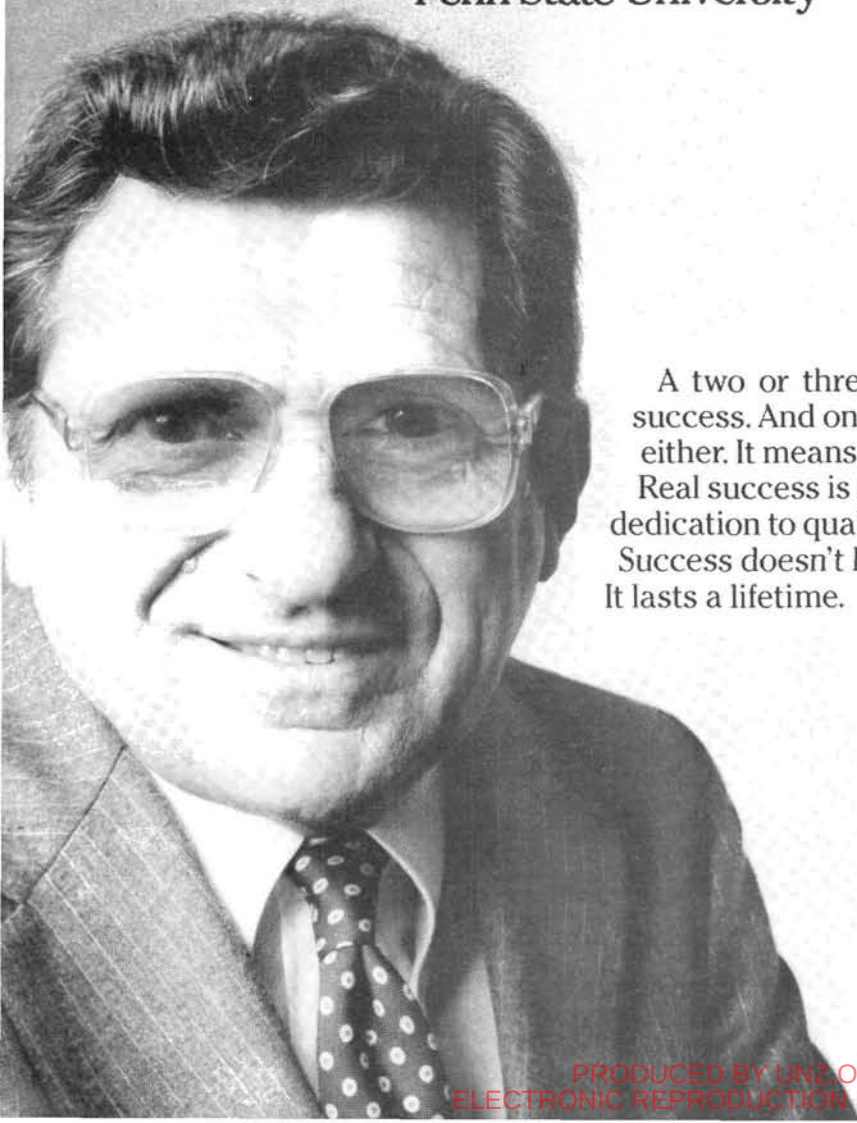


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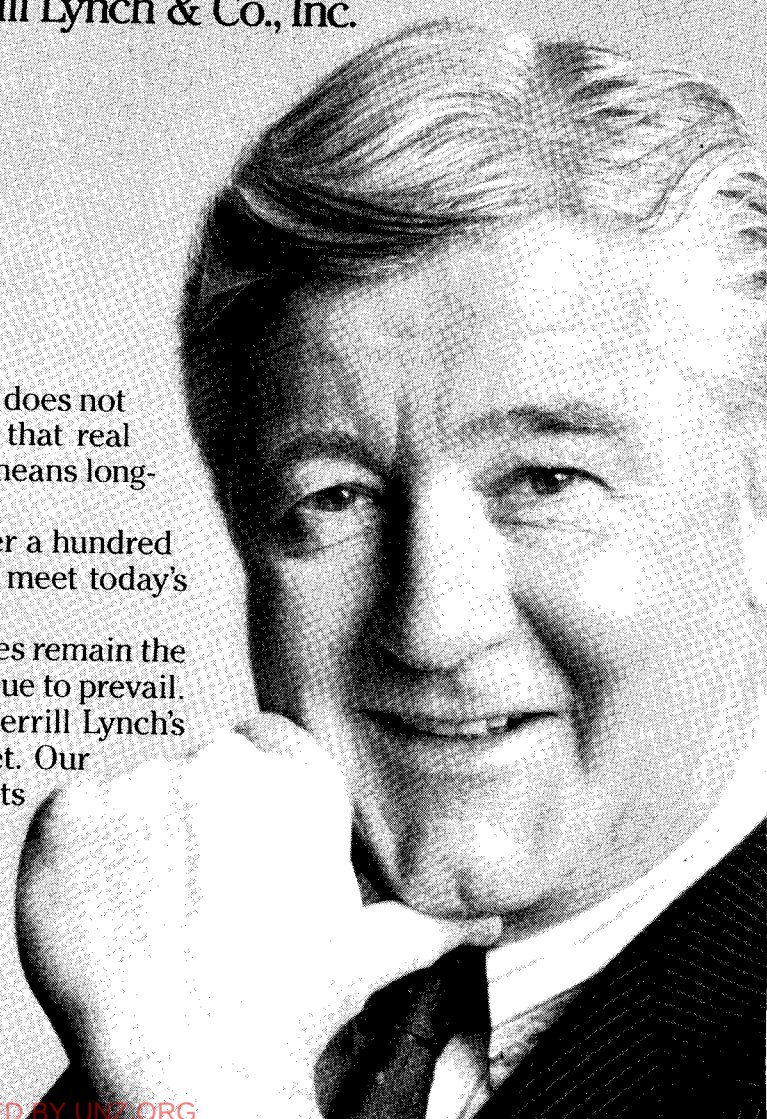
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Cover illustration by Robert Giusti



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\$6.00 additional per year elsewhere.
Address all subscription correspondence
to Atlantic Subscription Processing Center
Box 2547, Boulder, Colorado 80322
(800) 525-0643
In Colorado 1-447-9330

Printed in the U.S.A.
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The Atlantic Monthly Company
(ISSN 0276-9077)
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Public relations:
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RLP Incorporated
(212) 688-4058
445 Park Avenue
New York, New York 10022

The Atlantic April 1988
Volume 261 No. 4

Published monthly by
The Atlantic Monthly Company
8 Arlington Street
Boston, Massachusetts 02116

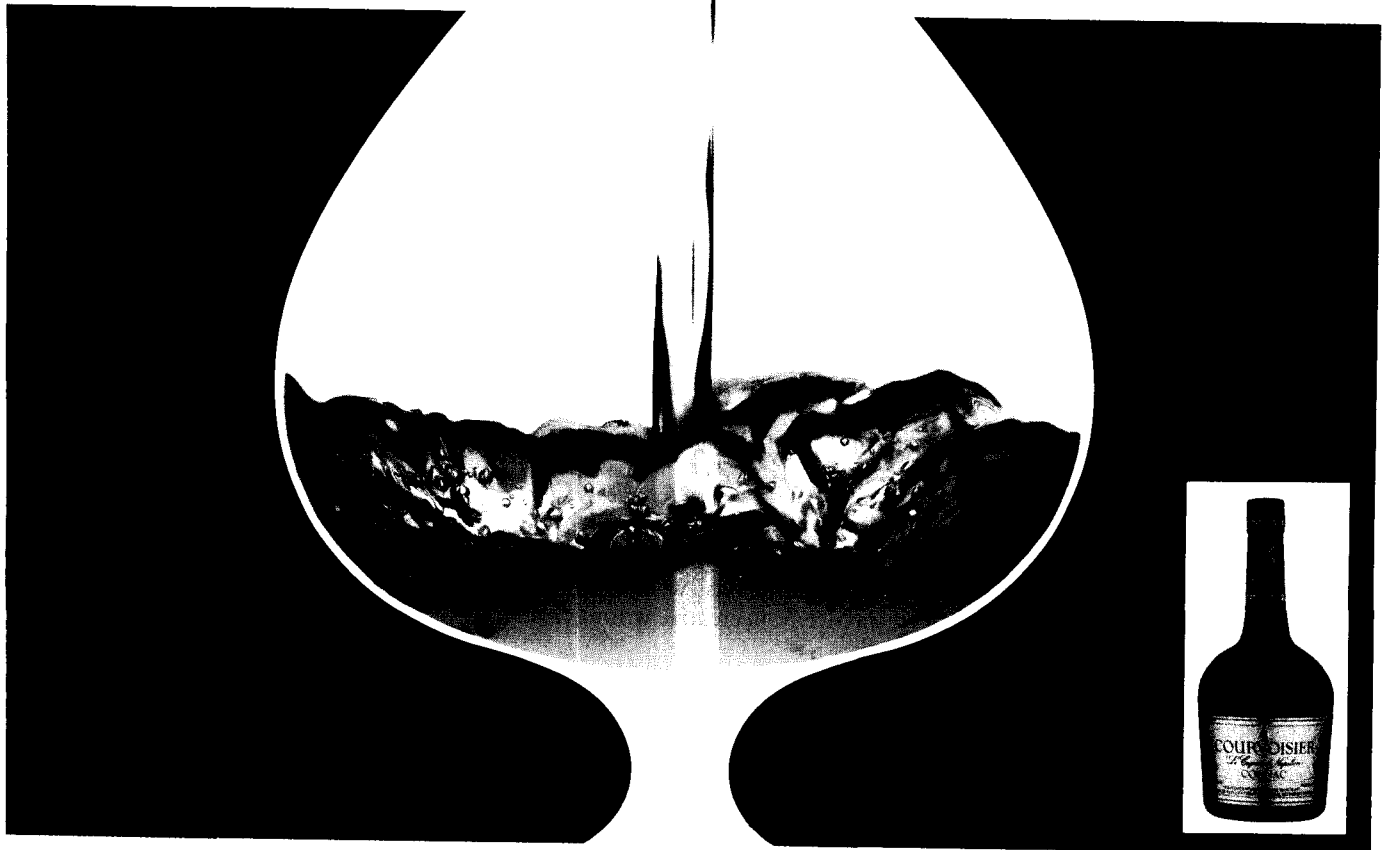
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LETTERS TO THE EDITOR

LOS ANGELES

The regional approach to solving problems in metropolitan Los Angeles, as portrayed by Charles Lockwood and Christopher B. Leinberger in "Los Angeles Comes of Age" (January *Atlantic*), is fostered not only by the decentralized tradition of the area's development and early linkage by the Red Car trolley network but also by the simple fact that the area lies within a single state. In contrast, the problems of Los Angeles's sister in the East, New York, can be solved only by an approach that takes into account the needs of neighboring New Jersey and Connecticut. New York and its neighbors face serious garbage-disposal problems, for example, as land-fills close while opposition to incineration plants mounts. The rising costs and environmental hazards associated with garbage disposal are vexing enough for any metropolitan area, but Angelenos can at least work toward regional solutions without having to deal with three separate state governments at almost every turn. Los Angeles does indeed seem poised to assume the role of the nation's major player among cities in the twenty-first century, primarily because of its proximity to the Pacific Rim, but also because of its status as a region within the confines of a single state.

WILLIAM E. COOPER
Iowa City, Iowa

On behalf of screenwriters everywhere, thank you. In "Los Angeles Comes of Age," Lockwood and Leinberger labeled us "consultants," which is probably the most respectable thing we've ever been called.

However, the label "Third World city," slapped onto Los Angeles by the authors, seems unfortunate, especially when equated with "non-European." The term *Third World* usually denotes non-aligned developing countries. I'm pretty sure the Japanese immigrants mentioned in the article don't consider themselves to be from a Third World country.

Perhaps what the authors were getting at was that L.A. has become a multi-ethnic city in which every culture has retained and celebrated its ethnicity. In that sense L.A. is more of a mosaic than

a melting pot—which alone would set it apart from the rest of the country.

RENE BALCER
Los Angeles, Calif.

Mayor Tom Bradley is not in his third term, as Lockwood and Leinberger state. He's about to go for his fifth. No Los Angeles mayor had ever won four terms before. Also, Los Angeles has the largest non-partisan municipal government in the nation. This creates unique lobbying mechanisms and influence-peddling patterns that have affected the city's development in many ways.

Describing the ethnic makeup of the current city council, the authors note that two councilors are Hispanic and three are black; the remaining ten are said to be Anglo, but one of them, Mike Woo, is Chinese.

Yes, L.A. has two fancy new art museums, and about time. But the single Diego Rivera in the County Museum is all that either museum can show in the way of modern Latin American art. Although the majority of L.A.'s school population is of Central American or Mexican-American background, you will see more of that cultural heritage in the museums of New York. Or Detroit.

It was a good idea, perhaps, to de-emphasize the importance of the entertainment business in Los Angeles, but no other business is nearly as significant a factor in the region-wide mentality. And what other city this vast has any commercial activity so integral to its spirit that it's always referred to simply as "the Industry"?

The authors mention something they call "smog particles," which are "washed out of the air," as a factor in ocean pollution. This is news to local air pollution experts. Most of the area's smog is not particulate but gaseous. Alerts are called by the local Air Quality Management District for high levels of carbon monoxide, nitrogen dioxide, and ozone—all gases.

Similarly, when the authors refer to ocean pollution from "industrial sludge," I assume they mean sewage sludge, which is no more industrial than similar residues from any city's treated sewage. Since November that stuff has gone to landfills—not into the ocean, as stated

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Finally, opinions run strong in this automotive paradise on the prospects of the Metro Rail rapid-transit system—particularly the negative opinions. But if the authors had had a good look at the Alvarado Street region served by the subway's first link (described as "a run-down area") they might have noticed the implications of its dense population of recent immigrants.

These people mostly work downtown. The workers aren't part of the megaplanner's big picture, but they have to get to work anyway, and many of them cannot afford auto transportation. If anyone bothered to ask them, they might describe the initial 4.4-mile subway as not a boondoggle but a boon.

MARC HAEFELE
Los Angeles, Calif.

It was a pleasure seeing *The Atlantic* take an interest in the Pacific. Charles Lockwood, Christopher B. Leinberger, and especially Nicholas Lemann made creative use of the *Los Angeles Times*, to their credit and ours.

One fact they did get wrong: Otis Chandler is not the publisher here;

Tom Johnson is, and has been for some years.

JACK MILES
*Los Angeles Times
Los Angeles, Calif.*

Your otherwise perceptive analysis of Los Angeles fails to dispel one misunderstanding popular among outsiders and Californians alike: that the enormous influx of Latin and Asian immigrants, whether legal or illegal, is a new phenomenon. Both groups have been migrating to Southern California in substantial numbers throughout much of the area's history. Nevertheless, a large segment of both groups has been and continues to be exploited economically, disdained culturally, discriminated against socially, and ignored politically by the Anglo establishment. That these alienated "minority" groups would someday constitute a majority of the population, and that their growth and influence would force power-sharing and coalition-building in order to solve serious urban problems, have long been predicted by some observers but ignored by the politically powerful, the middle class and

the affluent, and even the image-makers in the entertainment industry.

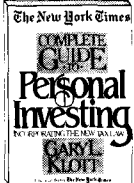
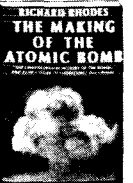
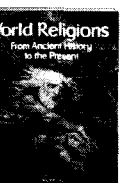
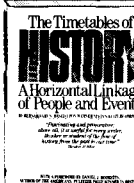
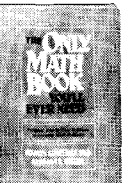
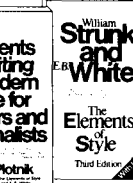
Given this tradition of neglect of Asian and Latin groups, whose political participation is now essential for successful problem-solving, L.A.'s current social and environmental problems appear insurmountable. But they are not. What may prove more difficult to overcome is the grip on political and economic power by the elite. This is the lesson Los Angeles offers other cities, and it is hardly a new one in the history of metropolitan areas.

FRANK J. GARZA
Los Angeles, Calif.

Surely the significance of Southern California's transformation into a community bordering on sheer madness deserves to be documented, not trivialized. Your assembled apologists and civic boosters, in awestruck admiration of a city that has sacrificed a livable future for the dubious benefits of a quick buck, missed the point about L.A.'s problems.

There is *no* solution to the problem: of growth and development in Southern California. The environmental, aesthet

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ic, social, and psychological costs inherent in the existence of Los Angeles are a price all of us will be paying, financially and otherwise, well into the next century. Rather than celebrate the Los Angeles phenomenon, we should be figuring out how to prevent the same runaway growth from dehumanizing Houston, Phoenix, and other cities that may still have a chance to become livable communities.

JOHN MILLER
Palo Alto, Calif.

The causes of the Los Angeles traffic dilemma are simple enough. Automobiles and trucks in Los Angeles, as elsewhere in the United States, are heavily subsidized. These subsidies average \$2,500 per car for the use of land and services—more for trucks. The result is a proliferation of cars and trucks—far too many for efficiency or for convenience. Parking, generally free or validated in Los Angeles, makes up the bulk of these subsidies. Municipal governments, heavily into services essential to motoring, such as police protection and road maintenance, provide the rest.

Los Angeles's Century Freeway, described as costing \$1.7 billion, will actually cost \$4 billion if all the costs are included. It will serve about 120,000 drivers per day, at a cost of about \$6.50 per trip.

Metro Rail, which the authors decry, will serve more than 300,000 patrons daily, at a cost of \$1.50 per trip.

STANLEY HART
Altadena, Calif.

Charles Lockwood and Christopher B. Leinberger reply:

We agree with William Cooper, appreciate Marc Haefele's willingness to correct a number of factual errors, and note that John Miller's reaction is typical of that of many Northern Californians regarding Los Angeles's rising economic and cultural influence. There is much to malign in Southern California, but, for better or for worse, it is setting the course for the twenty-first-century city.

As for Stanley Hart's concern, automobiles and trucks are indeed subsidized throughout the United States, though generally by user fees paid by all drivers in gasoline taxes. This being no

more and no less true in Los Angeles than anywhere else, it is one of the major reasons that *all* areas of new development in *every* American city are taking on the urban form first seen in the Los Angeles area.

EPHEMERAL STATES

Re "Ephemeral States," by David Rowen, in the January *Atlantic*: Whatever else we may or may not know about the lady who attempted to have herself recognized as the Queen of "Atlantis Kaj Lemuria," we do know that she is an Esperantist. I'm surprised that you did not spot this, after publishing James Fallows's excellent article on Esperanto.

The clues are her use of the conjunction *kaj*, which is simply the Esperanto word for "and," and the three additional islands of Flamingo, Odino, and Thoro (all Esperanto nouns end with an *o*).

Incidentally, your magazine is absolutely *bonega*.

ROBERT E. FERRIS
Bellingham, Mass.

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David Owen replies:

*Mi tre bedauras, ke mi estis neglektema.
Mi satus certigi, ke ĉi tio ne okazos denove.*

(I am very sorry that I was negligent. I should like to assure you that it will not happen again.)

AVOIDABLE OIL CRISIS

I disagree with many aspects of "The Avoidable Oil Crisis," by Amory B. Lovins and L. Hunter Lovins (December *Atlantic*). Here are the ones that bothered me most:

The Lovinses reject a tax on oil because it would (a) be a hardship for low-income people and (b) "distort investment and purchasing choices between oil and other fuels." With respect to (a), if a tax on oil is effective in reducing the consumption of oil, it accomplishes a most desirable objective. The low-income people who are adversely affected, since they account for only a small percentage of total oil consumption, can have the impact ameliorated through such devices as tax credits or rebates. Sales taxes and excise taxes have the same adverse impact on the poor, but because they are deemed to provide an overall good, they are enacted, and their impact on the poor is assuaged by other means.

As for (b), to the extent that a tax on oil encourages the use of other, more available sources of energy (electricity, for example), that, too, is good. It achieves the objective of reducing the demand for oil—something essential for our national health.

The Lovinses toss away any thought that a cutoff of foreign oil could be a threat to national security. After all, they say, the Department of Defense uses less than three percent of the total national consumption, we have a strategic reserve, and we have many sources of supply with an expandable capacity for producing oil. However, in a war situation the military requirement would balloon, the sea lanes by which we obtain oil from foreign sources would be under attack, and the sources themselves might be involved in one way or another and might require the oil for their own use.

The article also points out the reduced role of OPEC in world oil supply. What is overlooked is that Arab OPEC's oil reserves are far greater than those of other countries from which we purchase oil. Thus, as domestic demand in those

other countries increases, and their resources decline, less of their oil will be available for export. Moreover, while our imports from Arab OPEC in recent years were much below those of the late seventies and early eighties, in 1986 they increased sharply to the highest level since 1981.

The fact of the matter is that oil is essential to a viable industrial economy, and the United States could be facing a severe oil problem in the future. It is vital that we find ways of reducing demand (or constraining its increase) and increasing supply. We must also look to the future and develop an alternative to oil for transportation. As of now, we are many years away from one. Not only must we find an alternative fuel but we must also develop an infrastructure to produce and distribute it, and provide for a transition from an existing fleet of vehicles to one that can use the new fuel. I find little in the Lovinses' article to help us along the way.

SAUL HOCH
Silver Spring, Md.

Opening the Arctic National Wildlife Refuge to oil and gas leasing is hardly at odds with the economic and strategic benefits of energy conservation, as Amory and Hunter Lovins contend in their otherwise excellent article. As the Lovinses' article correctly recognizes, "the decades-long switch" from oil to renewable sources of energy will not be quick or cheap, and oil will play a major role in this transition. During these critical years it plainly does not make sense to refuse to explore the area that is, by all accounts, the nation's best prospect for a major domestic oil find.

I strongly endorse the Lovinses' energy-conservation arguments and hope that the makers of our national energy policy will act on them. But it simply does not follow that shutting down oil exploration on Alaska's North Slope would help achieve the many benefits of energy conservation.

STEVE COWPER
*Governor of Alaska
Juneau, Alaska*

Amory B. Lovins and L. Hunter Lovins reply:

Our article and Hoch's letter seek a secure, affordable, post-oil energy future. We think his preferred means (oil taxes and finding lots more oil somewhere) cost too much and do too little.

Favoring some fuels over others has

historically caused vast, unforeseen mischief: federal price meddling helped create shortages of both oil and gas. But the worst problem with oil taxes is that they work slowest where oil is hardest to replace: in transport.

In the early 1980s Americans did, in effect, pay huge oil taxes to OPEC. Users who could switch away from oil (chiefly in industry) did so, often permanently. But in transport most savings came from new-car standards, *not* price. Airlines and truckers largely passed higher costs on to customers. Poor people, who own the least efficient cars, couldn't afford to replace them with efficient new ones. Yet even for the affluent, gasoline at \$1.35 a gallon in 1981 was, and at \$2–\$3 a gallon would be, a weak signal to buy efficient cars. Why? Because fuel cost is only a fifth of the total cost of owning and operating a car (as of 1984), and efficient cars tend to cost about as much more to buy as they cost less to run.

Standards, car taxes, and rebates *can* rapidly upgrade vehicles. The best five-passenger prototype car—safe, peppy, comfortable, and 71 mpg—would save an ANWR every three years. A 3 mpg gain in our 18-mpg fleet eliminates Gulf imports.

We didn't casually "toss away" the national-security threat of an oil cutoff, though we showed why it's probably an exaggeration. Rather, we showed the fastest and cheapest way to get rid of it. Further, unless the proposed war is on American soil, U.S. oil wells won't help: tankers sailing from Houston are as vulnerable at sea as those sailing from the Persian Gulf. In a nuclear war, oil would be among the least of our worries. Fighting a non-nuclear war in the Gulf could easily use more oil than the United States gets from the Gulf. And in a war with an unconventional adversary like Iran, American pipelines (especially in Alaska), reserves, and refineries could be among the first casualties of sabotage, so new oil wells drilled in the name of national security would be useless.

If Governor Cowper thinks ANWR oil is a good buy, he should welcome prior scrutiny of its economics before rushing to expand exploration into a unique area already reserved for other important public purposes. If Congress doesn't know better, it may choose ANWR oil at more than \$30 a barrel, assuming any is found; there's about 90 percent odds of finding none but a 100 percent chance of trashing the refuge. But if Congress looked seriously at efficiency, it would

find (our preliminary analyses suggest) a full practical potential to save about three fourths of all oil now used in the United States, at an average cost below \$10 a barrel. That's equivalent to finding ANWR's projected average annual output every *month*, forever. If we work together to develop much of this capacity, then the oil we don't agree about will become superfluous.

ADVICE & CONSENT

You claim, in the January Letters to the Editor, that readers who comment on your fall-foliage piece in the October Almanac "apparently assume that by eastern North America" we solipsistically meant 'the Northeast' rather than 'eastern North America,' of which Missouri and Minnesota are clearly a part."

If you look at the two letters again, you'll find that neither of them mentions the Northeast. If you recall some American history, you may understand why most people think that one state that is entirely west of the Mississippi River and another that is largely so are not "clearly" in eastern North America.

CHARLES A. MILLER
Lake Forest, Ill.

[I was a little surprised that you printed a letter in response to Peter Peterson's article "The Morning After" (October Atlantic) such as that of Steven R. Helms, so uninformed about our budgetary history over the past seven years.

The budgetary history of Reaganomics is easy to summarize. Annual military spending has risen from \$157.5 billion to \$294 billion (\$60 billion less than Reagan wanted) from 1981 to 1988. Annual discretionary domestic spending has risen only from \$168 billion to \$185 billion over that time span, a decline of 7 percent in real terms (from 4.9 percent of GNP in 1982 to 3.9 percent in 1987). Mandated entitlement programs which Reagan has steadfastly refused to cut, even after the Senate's vote to do so (on May 10, 1985) and interest payments on the debt account for the rest of the pending increases. According to David Stockman's figures, had Reagan gotten his way entirely on military spending and tax policy, the 1986 deficit would have exceeded \$350 billion. In view of this, how can you print a letter that blames Congress for the deficits?

RAYMOND C. TOGTMAN
Palos Heights, Ill.

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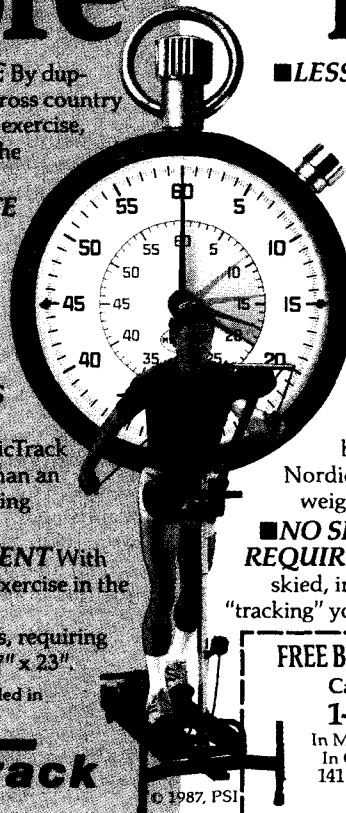
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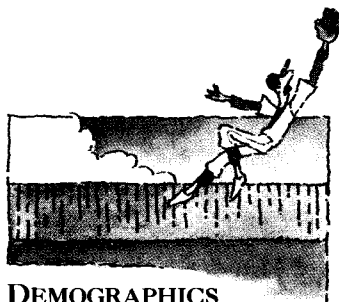
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THE APRIL ALMANAC



DEMOGRAPHICS

April 4, opening day for the sport whose players are the most representative of American society, in terms of ethnicity and size, of those of any major professional sport, and are also more representative of the society in general than are the sport's spectators. Most professional baseball players are white; 24 percent are black, versus 12 percent of Americans generally; and 10 percent are Hispanic, versus 8 percent. Only 6 percent of those who attend baseball games are minorities. Unlike basketball players, who are, on average, more than six and a half feet tall, and football players, who weigh, on average, 228 pounds, the average professional baseball player approximates the American male norm. Here's where the similarities stop: the average baseball player's salary is \$412,000. If you had assembled a team last year in which each of the nine positions was filled by the highest-paid major-league player in that position, your payroll would have been \$17 million.

ARTS & LETTERS

April 15, the deadline for submissions to the Bulwer-Lytton Fiction Contest, otherwise known as the Wretched Writing Contest, for the worst original opening sentence of a proposed novel. Scott Rice, a professor of English at San Jose State University, established the award in 1983. He explains: "There are numberless writing contests, and all of them ask for good writing. But they usually attract bad writing. So I decid-



ed to be up-front about it." Last year Rice received some 10,000 entries. One of the winners: "The sun rose slowly, like a fiery furball coughed up uneasily onto a sky-blue carpet by a giant unseen cat." Edward Bulwer-Lytton, the Victorian novelist, began his novel *Paul Clifford* with the words "It was a dark and stormy night. . . ." His only other famous quotation—"The pen is mightier than the sword"—doesn't actually mean what most people think it does, for it is the second half of a couplet that begins, "Beneath the rule of men entirely great . . ."



ENVIRONMENT

April 6-10, the annual meeting of the Association of American Geographers, in Phoenix, Arizona, where some 1,300 papers will be presented by professionals in this most eclectic of sciences. When the subject of geography surfaces in the press these days, it is usually to provide one more appalling example of American ignorance—you know, 73 percent of those surveyed think that Mexico is part of Canada, or keep forgetting that Upper Volta is now Burkina Faso. But geography is a broad and changing discipline. There will be fewer papers this year than there were a generation ago in the realm of cultural or social geography, and far more, thanks to advances in remote sensing and computer-aided mapping, on man's re-making of the natural world.

GOVERNMENT

April 1, Congress recesses; it will reconvene on April 11. April 15, federal income-tax returns are due. Also on this day the Tax Foundation, of Washington, D.C., will announce the date of Tax Freedom Day, on which, if the average worker's wages starting on January 1

went in full to the paying of his federal, state, and local taxes, his obligation for the year would finally be satisfied. The foundation expects that Tax Freedom Day will fall this year in early May; in 1930 it fell on February 13. Primaries or caucuses will be held this month in Colorado (April 4), Wisconsin (5), Arizona (16), New York (19), Utah (25), and Pennsylvania (26), to help decide who will preside when Tax Freedom Day creeps into June.

HEALTH & SAFETY

April is VD Awareness Month, Cancer Control Month, and National Occupational Therapy Month. April 24-30, National Eating Disorders Awareness Week. Three diseases fall under the heading of eating disorders: anorexia nervosa, bulimia, and compulsive overeating. It is estimated that 6 percent of all serious cases of these illnesses end in death. Bulimia—characterized by binge-and-purge eating behavior—is the fastest-spreading eating disorder and now afflicts one woman out of 20. Because bulimia is so often induced by suggestion—many people fall victim by emulating the behavior of friends—it is treated by many physicians as if it were a communicable disease.



THE SKIES

April 2, Full Moon, also known this month as the Sprouting Grass Moon. 3, Easter Sunday; at 2:00 A.M. local time Daylight Saving Time begins. The word *Easter* comes from Eostre, the name of a Teutonic goddess in whose honor a festival was held every spring. 16, New Moon. 21, the Lyrid meteor shower peaks at 11:00 P.M. EST. This is the earliest recorded of any of the major meteor showers; it was documented by Chinese astronomers in 687 B.C.



FOOD

Day lilies, violets, and dandelions are all in bloom this month. Many of these flowers will be cut down in their prime, butchered, and actually served to human beings in salads, soups, pasta, and ice cream. Edible flowers—roses, nasturtiums, pansies, and the flowers mentioned above being among the most popular—are now a staple of the nation's most avant-garde restaurants. Paradise Farms, in Carpinteria, California, one of the nation's largest growers of organic flowers, reports that sales have tripled in the past two years.

125 YEARS AGO

Harriet Beecher Stowe, writing in the April, 1863, issue of *The Atlantic Monthly* about Sojourne Truth and an incident at a gathering of abolitionists: "It was at a crowded public meeting in Faneuil Hall, where Frederick Douglas [sic] was one of the chief speakers. Douglas has been describing the wrongs of the black race, and as he proceeded, he grew more and more excited, and finally ended by saying that they had no hope of justice from the whites, no possible hope except in their own right arms. It must come to blood; they must fight for themselves, and redeem themselves, or it would never be done."

"Sojourner was sitting, tall and dark, on the very front seat, facing the platform; and in the hush of deep feeling, after Douglas sat down, she spoke out in her deep, peculiar voice heard all over the house, 'Frederick, is God dead?'"

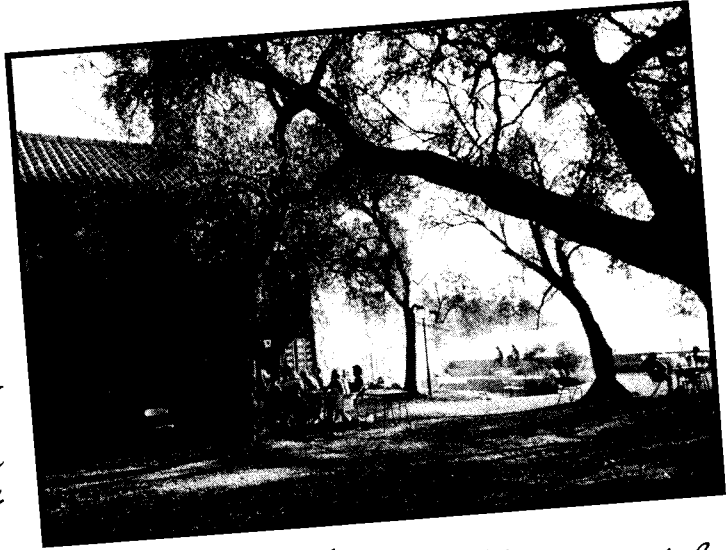


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Two weeks ago (or was it six decades?) it took us to gemütlich Zagreb, where storks roost on tall chimneys. We sipped sweet, inky coffee and traded rounds of slivovitz, burning with essence of plums, with some local artists and came away only a few dollars poorer.



In the Julian alps, we tramped through the wildflower fields we could see from our snug, crisp-sheeted room. It was only \$25. for the night. For a little more than twice that we could have stayed in its palatial counterpart, cushiony with damask sofas and Persian carpets.

On up the coast that could have been the Riviera of Hemingway, Fitzgerald or Cole Porter, we hired a cruiser for the day (\$35.) and found a whole island we could have rented for the night.

Back at our hotel, we dined on a mountain of prawns with a delicious local wine that wouldn't be found anywhere else. The check didn't come to \$30, including the moonlight.

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REPORTS & COMMENT

NOTES

WAR IS HECK

Was I scared floating around in a little yellow raft off the coast of an enemy-held island, setting a world record for paddling? Of course I was. What sustains you in times like that? Well, you go back to fundamental values. I thought about Mother and Dad and the strength I got from them—and God and faith and the separation of Church and State.

—George Bush,
on the campaign trail last winter

SOMEWHERE OFF Chichi Jima, September 2, 1944—So much for Big Mo. I mean we go in with the top of the lineup and kick a little ass, drop our 500-pounders and knock out a radio tower, and then suddenly we're getting the darnedest flak you've ever seen and the next thing I know the *Barbara's* in the soup. I've gotten a lot of grief for naming my plane after Barb, which ticks me off—but by golly, as I watch the old gal sink I can't help but draw an enormous reservoir of strength and resolve from the Supreme Court's decision last year in that Jehovah's Witnesses case: "A person gets from a symbol the meaning he puts into it, and what is one man's comfort and inspiration is another's jest and scorn." *West Virginia State Board of Education v. Barnette* (319 U.S. 624, 63 S. Ct. 1178, 87 L. Ed. 1628) is a real cracker-jack of a case. I mean, here's George Bush on a raft that's a piece of junk, something they'd be ashamed to sell at Bean's, and I'm in the middle of nowhere and out of fresh water, and I've got this gash on my forehead, and yet Mr. Justice Jackson's opinion is kinda there for me, like a rock.

Am I in deep doo-doo? Goodness, yes. Am I worried? You betcha I'm worried. What scares the dickens out of me are those kamikaze guys. It's a religious thing, they tell me—three-two-one-BOOM, and it's straight to heaven, or wherever. And when I think about looking at the front end of one of these fellas, I have to wonder about *Murdock v. Pennsylvania* (319 U.S. 105, 63 S. Ct. 891, 87 L. Ed 1292) and whether this kind of behavior, to quote Mr. Justice Douglas, really ought to have "the same claim to protection as the more orthodox and conventional exercises of religion." And I've got to say, in a situation like this you thank your lucky stars for *Cantwell v. Connecticut* (310 U.S. 296, 60 S. Ct. 980, 84 L. Ed. 1213) and Mr. Justice Roberts's opinion that "even the exercise of religion may be at some slight inconvenience in order that the State may protect its citizens from injury." Maybe it's because I'm only human, like the next guy, but gosh, just the whole

notion of separation of Church and State is a tremendous source of hope and consolation.

Is my number up? Is this all she wrote? I'm just glad I don't have to be concerned about Barbara, how she might take the news and all that, what she might do. It's times like now, when you've maybe got an eye cocked upstairs, when you're maybe thinking about the Big Guy, that your thoughts turn inevitably to *Reynolds v. Unitea States* (98 U.S. 145, 25 L. Ed 244), and there's no way you don't come away fortified and sustained. If a woman "religiously believed it was her duty to burr herself upon the funeral pile" of her beloved, Mr. Chief Justice Waite asked "would it be beyond the power of the civil government to prevent her carrying her belief into practice?" Heck, no, he decided, we can't let her do such a darn fool thing. I've gotta love my country fo that.

—Cullen Murph



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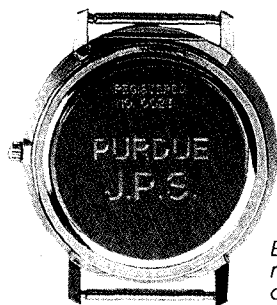
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THE FAR EAST THE OTHER JAPAN

*A visit to Sanya, a Tokyo slum,
reveals the peculiar nature
of Japanese poverty*

NOT MANY JAPANESE are interested in visiting Sanya, but for a foreigner it's a compelling destination. Before I went, I'd heard it described as Tokyo's largest slum. It's not exactly a slum, as Americans understand the term, and its pathologies would barely be noticed in a city with more glaring problems, like Manila. Still, this rare illustration of Japanese social breakdown is in its way as instructive as the country's many and more obvious successes.

The ideographs that make up Sanya's name mean "mountain valley," but it's actually a featureless flatland in the northeast corner of Tokyo, bordered by a crook of the city's major river, the Sumida. Through hundreds of years of Tokyo's history the area has been, as William Wetherall put it in the *Far Eastern Economic Review*, "a repository for the bottom of Japanese society." Japan's rush into modernization began with the Meiji Restoration, in 1868, but in the long preceding era of shogun rule Sanya had been one of Edo's (old Tokyo's) main execution grounds. From the thirteenth to the nineteenth century some 200,000 people are supposed to have been beheaded, crucified, or otherwise

put to death there. The ordinary-looking traffic overpass that spans Sanya's main intersection is even now called Namidabashi, "Bridge of Tears." The street it crosses used to be a small river that separated the realm of criminals and outcasts from the city that had expelled them. Here Edo-era families said goodbye to errant relatives about to cross the bridge to the other world. Some people still call the main avenue in Sanya the Street of Bones.

Whether because of the ghosts hovering over Sanya and the blood in its soil, or simply because of the momentum of urban growth, Sanya never developed a "normal" business and residential base like the rest of the city. Even after the executions stopped, it was a refuge for fringe characters, such as worn-out and over-aged prostitutes from the nearby Yoshiwara pleasure zone, and for Japan's class of outcasts, who performed "unclean" duties, such as leatherwork and handling the dead. About 45,000 people now live within the area commonly referred to as Sanya. Most of them are normal working-class Japanese, but about 7,000 are "flop-house occupants"—derelicts, bums, and casual laborers who live in the many flophouses and shelters of Sanya when they're not living on the streets.

Just how rough and tough today's Sanya seems depends on what you're expecting, which in turn probably depends on whether you're from Japan. On my first visit, in 1986, I went with a Japanese friend who usually comes across as Mr. Cool. As we emerged from the subway station, I noticed that he was

suddenly walking with hunched-up shoulders and wearing an apprehensive expression, looking around nervously every few seconds, behaving as most Americans would in a dangerous part of town. Apparently we'd crossed the border into Sanya—I hadn't detected the change myself. A few minutes later, when we were stepping over drunks lying on the sidewalk and passing men urinating woosily against walls, I realized that Sanya was indeed different from the rest of Tokyo. But at the same point it became clear that Sanya is, rather than a slum, what Americans would call a Skid Row or tenderloin district, full of people who are not just poor but also sick, drunk, down-and-out. In specific, it lacks two elements that make true slums, in the United States and elsewhere, so alarming.

The first thing it lacks is families. There are no children in the Sanya flophouses, no teenagers that I saw, and practically no women. Nearly all the inhabitants are full-grown men, usually middle-aged or older, who for a variety of reasons have slipped out of the work-and-family network that holds the rest of the country together. Their stories are of course sad, but there seems to be no chance that they will spawn an even sadder multi-generation "culture of poverty" in Sanya. The absent father is known as the missing member of American slum society; absent fathers, brothers, and sons are the mainstays of Sanya.

The second classic slum element that Sanya lacks is an air of impending danger. This is not to say that it is a calm or harmonious place. Since 1984 there have been two notorious Sanya-related murders. In one case, a film director working on a leftist documentary about Sanya was stabbed to death there. In the other, a labor activist trying to organize Sanya's residents was gunned down in another part of town. Many of the people on the street have black eyes, visible bruises, oozing cuts. The violence of American slums is mainly visited on other people in the slum, but a lot spill out. Sanya's violence is more completely self-contained. The two killings were politically motivated; they were the work of the *yakuza*, Japan's gangsters who organize Sanya's main racket—finding day-labor jobs for the derelicts in return for kickbacks from the daily wage. The *yakuza* often overlap with right-wing Japanese-nationalist groups and through the 1980s there have been

recurrent shoving matches and fights in Sanya between the *yakuza* and leftist groups trying to break the gangsters' hold. The killings are said to have been an extension of this struggle, as the *yakuza* tried to rid their territory of meddling do-gooders.

Sanya's residents are always vulnerable to being caught in the political cross fire or robbed or beaten by their neighbors. If they wander out into the rest of the city, they may be attacked by gangs of schoolboys who look for drifters to beat up. (This phenomenon, involving groups of otherwise respectable adolescents, has caused much worried comment in the press, which usually ties it to intense academic competition and to the prevalence of bullying, or *ijime*, in the schools.) But Tokyo's other 10 million people can still lead untroubled, crime-free lives in happy ignorance of the turmoil in Sanya. In the course of three visits the most aggressive behavior I encountered was from a stumbling, palsied-seeming man who draped his arm around me and with beery breath kept shouting, "Okay, Joe! Okay!" into my face.

I should mention a third important difference between Sanya and the worst American slums: the members of Japan's "underclass" are the same race as everybody else. True, Japanese society does contain tangled, caste-like barriers of discrimination, especially against ethnic Koreans and the ancient untouchable class once known as *eta* ("filth") and now as *burakumin*, or "hamlet people." Their euphemistic new name comes from the isolated settlements, or *buraku*, in which until about a hundred years ago they were required to live. The *burakumin* are still discriminated against in school and work, as the Burakumin Liberation Research Institute, in Osaka, has documented, and they and Koreans are overrepresented among *yakuza* and Sanya slums. But the attitudes that oppress them can't really be called racial discrimination, since the victims are not a separate race. Japan maintains a meticulous system of birth and family registers, usually in each family's ancestral village; these records, inspected by prospective employers or spouses, make it almost impossible to keep an "undesirable" background concealed. The registers are necessary precisely because other Japanese often can't tell who belongs in what caste by just looking or listening. I'm not sure whether this color-blind caste system is morally better or worse than

straightforward color prejudice, but it does remove racial complications from Japan's underclass problem.

These three differences from American and European slums—the lack of children growing up in a culture of poverty, little spillover crime, and the lack of a visible racial minority—help explain why mainstream Japan seems so little concerned about Sanya. If you get on the Chiyoda subway line near the Imperial Palace, you can get off the same train thirty-five minutes later at the Bridge of Tears. As Tokyo distances go, that's right next door, but Sanya might as well be in the South Bronx, or on Pluto, for all the attention its residents get from their fellow Japanese. The best-known relief center in Sanya is run by the Catholic Maryknoll order, and several other churches sponsor volunteers—this in a country that is less than one percent Christian. The volunteers at the centers and the donations on which they operate come disproportionately from the United States, Germany, and other foreign countries, not Japan. (In fairness, the Japanese chapters of American-style voluntary or charitable organizations are extremely weak, probably because other forms of organization in the country—family, school, work group—are so very strong.) But in addition to the three obvious factors that account for Sanya's isolation, I got the feeling that there was a fourth—embarrassment—that helped explain why people ended up in Sanya and why everyone else ignored them once they were there.

THE MAN WHO explained Sanya's meaning to me was Dr. Masahiko Katori. Katori is a psychiatrist whose regular job is as the president of a private mental hospital, but on Fridays he operates a general medical clinic in Sanya, sponsored by the Tokyo government, for token pay. Katori must be successful—he drives a new white sports car and lives in what is for Tokyo a very nice apartment—but you would not instantly deduce that on meeting him. He is a grizzled-looking man of sixty, missing several lower teeth. Most Japanese men pass out business cards on which their institutional rank is specified with minute precision; in conversation they expect to be addressed not as "Mr." but as "Section Chief," "Division Manager," and so on. "Hospital President" Dr. Katori never gave me a card and said only that he worked at a hospital. He talks

in a gruff voice, dresses in unconventional combinations of coats and pants, and has taken on some of the flavor of his clientele. "I feel like I'm becoming a kind of alcoholic just by being here," he told me with a melancholy laugh, in a coffee shop on the Street of Bones. "Before I came to Sanya, I could hardly drink half a beer. Now I may drink two or three bottles of whiskey a week. You could say alcoholism is an infectious disease!"

It may sound as if I'm mocking Katori, but that's not my intent. I admire him and what he does. He jokes about becoming an alcoholic, but he crusades tirelessly to get his patients off the bottle. He puts on slide shows, displaying biopsy slides of a cirrhosis-damaged liver; on his clinic walls are comic-book-style posters with tips on how to fend off the tuberculosis and pneumonia that finally kill those whom alcohol has softened up. He speaks about Sanya with a combination of tenderness and dispassion that I haven't encountered in American social workers. Unlike most of his fellow Japanese, he obviously views these bedraggled, dying derelicts as his brothers and feels sympathetic pain when they are hurt. But like most Japanese, and unlike many Westerners in comparable positions, he holds no-nonsense moralistic views about how each person contributes to his own downfall.

As Katori describes it, Sanya is full of people who were not strong enough to survive the collision between an old Japanese principle and the new Japanese life. The old principle, still very much in force, is that dignity comes from performing your duties as part of a group—the family, the company, the team. The new reality is that some duties no longer need to be performed. Technology has eliminated some, and Japan's impending "internationalization" and import liberalization will remove many more. Japan has tried harder than most countries to preserve traditional jobs, but even it can't preserve all of them forever. The loss of identity that comes with unemployment is hardly unique to Japan, but here it has a special sting, because honorably discharging one's duty matters more in Japan than anywhere else.

"In the old days this used to be an agricultural country," Katori said one time, as he walked me to a small sushi restaurant tucked incongruously amid the flophouses. "During the snow season people would come in from the countryside to find work. They had no way to

earn money in the home village, and here they could earn money for the start of the school year [which in Japan means spring]. It was a natural pattern for them to commute from the countryside to the city, then back to the country when the weather was warm."

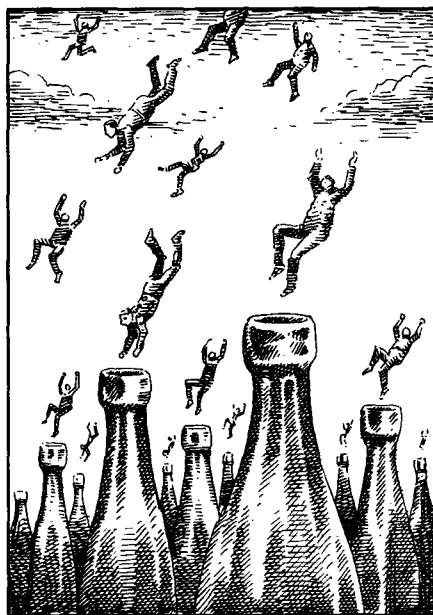
In Tokyo the natural job for the migrants was day labor on construction, dockyard, and general-labor gangs. Sanya became a center for itinerant day laborers, who spent their nights in the flophouses and their early mornings being mustered into work details by the *yakuza*. (There are similar areas in Yokohama, Nagoya, and Osaka, the one in Osaka being the largest day-labor and flophouse district in Japan.) The golden age of day labor was in the years just before and after the 1964 Tokyo Olympics, when the city went into a frenzy, similar to what Seoul has just undergone, of highway improvement, stadium-building, and general sprucing-up before displaying its rebuilt self to the world. "The people you see here," Katori said one afternoon as we walked through lines of bruised, pulpy-faced patients at his clinic, "they built the Tokyo you see."

He was not just speaking metaphorically. During the pre-Olympic building boom as many as 15,000 day laborers lived in Sanya. Many left when the boom was over and found other places in the great employment-security machine that is modern Japan. Those still in Sanya are the ones who couldn't adapt to anything else—which is why so many are in their fifties and sixties. "The Tokyo Olympics were the root of the problem," Katori said. "There was so much work then, people got absorbed here. They didn't go back home."

The old generation is fast dying out, hastened on by neglect and disease, but Katori claims that migration may be putting a new generation in place. It's a bad time to be a day laborer, because bulldozers now do the job that pick-and-shovel gangs did even at the time of the Olympics. Nonetheless, country people still come to Tokyo, as part of Japan's inevitable adjustment to the outside world. "Many of the people here are from Hokkaido, the coal-mine areas," Katori said. "The mines are closing"—even at 250 yen to the dollar, the price of Japanese coal was out of sight—"and the men don't know what else to do, so they come here looking for work. They are so ashamed. Those who used to mine coal by the ton—now they're supposed to

wrap candy with dainty fingers in the candy factories. It's hard for them.

"We are starting to have the regulation of rice production"—that is, the Japanese government is inching away from the enormous subsidies that have kept rice farmers in business—"so people come to the city from the farming regions. There used to be a lot of fishing far from Japan, but now other countries are restricting it, and the fishermen lose their jobs." Japanese whalers are being laid off too, and the papers have reported on whaling villages where everyone is suddenly out of work. "The longshoremen and stevedores in Yokohama lost their jobs when the container ships came. The railroads are going private this year and laying off workers." The



shipyards, steel mills, and aluminum smelters are shedding workers too. "We are starting to see a flow into Tokyo because of the strong yen."

To an economist, every one of the changes Katori described would make perfect, obvious, inescapable sense. For Japan to operate energy-eating aluminum mills is insane; for other countries to let Japanese boats fish their waters, rather than catching and selling the fish themselves, is simple neglect of self-interest. Moreover, each of these adjustments (except maybe the whaling one) resembles a painful change that Japan's robust industries have forced on some other country. I'm sure Katori would prefer that Japan not open its protected industries, but unlike some Western counterparts, his point was not that society is to blame. He seemed to be saying

instead that society had applied great pressure, by forcing people out of their familiar roles, and under that pressure some people broke.

"These men are mainly from rural areas, traditional backgrounds," he said. "They come hoping for work, but once they come here, they are discouraged. They start to miss their wives and children badly. They are heartsick for their familiar scenes. They tend to feel this ache most at night, and they can't go to sleep because of their worries. For a day laborer, what he fears most is not the hunger or the low wage. What he fears most is not being able to sleep. He knows he must get up very early to get work, and then work maybe in dangerous jobs all day. So to go to sleep he will drink—and drink and drink. In the evening time, you and I think of a drink with dinner. They drink to work tomorrow, but of course the amount increases and after a while they can't work at all."

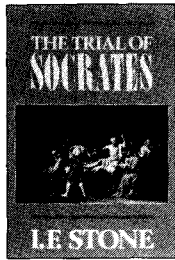
Eighty percent of the people in Sanya flophouses are alcoholics, Katori said. From looking around, I would have guessed a hundred percent, but he said that the rest were chronic gamblers plus a surprisingly large minority of "sweets addicts," capable of blowing any money they get on candy, in order to gorge. When they can find day labor, they can earn 7,000 to 8,000 yen a day (about \$56 to \$64), after the cut for the *yakuza*. A night in the flophouse is 750 yen; the rest, Katori said, goes for whiskey, beer, or *shochu* (a harsh spirit made from potatoes). Those with a little money can invest it with the *yakuza*, buying "work stamps" to prove that they've held more jobs than they actually have. Japan offers modest short-term unemployment benefits worth \$160 a month to laid-off day laborers, but only to those whose stamps show that they've worked twenty-eight days in the previous two months. The class divide in Sanya is between those still healthy enough for the 1,000 to 1,500 day-labor jobs typically available and those past that stage. Katori said that at a certain point men can no longer afford a flophouse, or would rather use the money to drink themselves to sleep on the streets. Small-time thieves prey on these pathetic men, sticking lighted cigarettes against their wrists to judge if they're comatose enough to be stripped and robbed.

"When they get to this point, it is a kind of chronic suicide," Katori said. "First they were commuting from their home village to the city every few

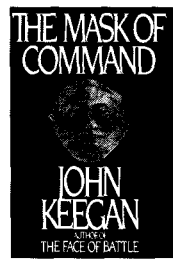
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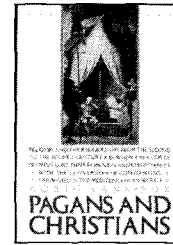
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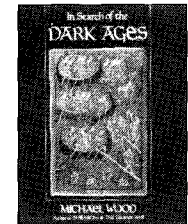
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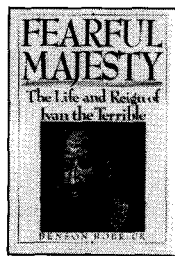
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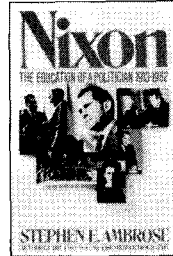
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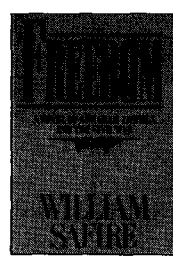
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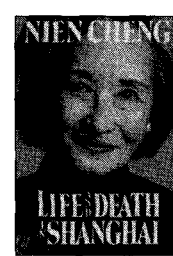
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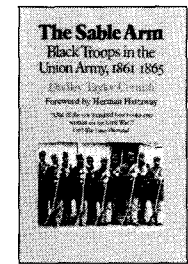
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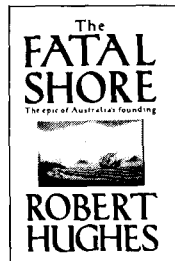
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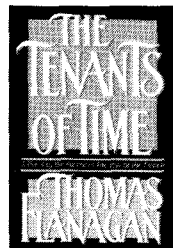
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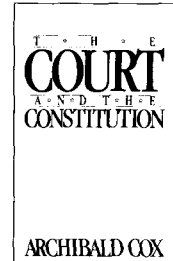
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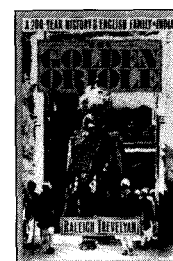
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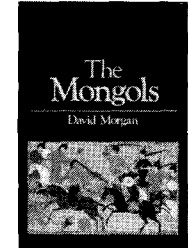
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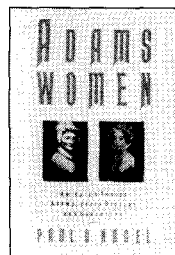
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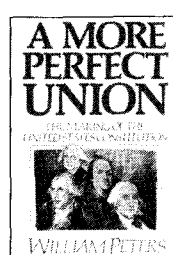
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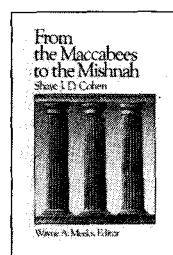
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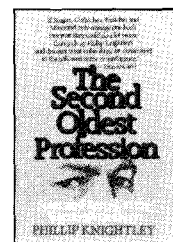
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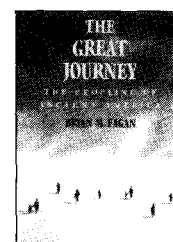
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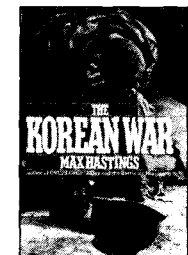
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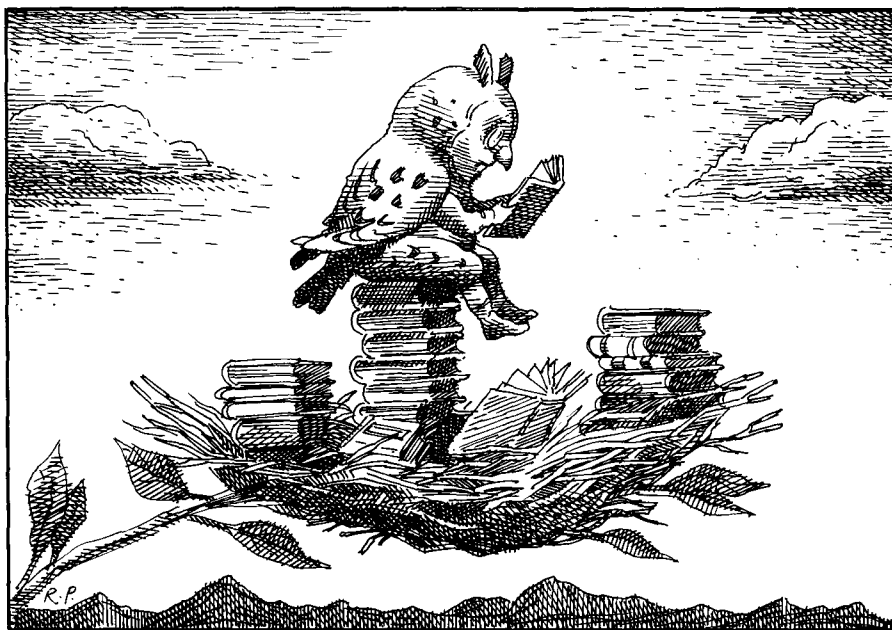
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months. Then they were commuting only from the flophouse to the day-labor site each day. Then they commute to the jail, then the hospital. When they can't make money any other way, they have three choices left: becoming thieves, selling their blood, or prostituting themselves with gays. This is disgusting to me. When they don't have jobs, they try to get hit by deluxe cars. Some people have made a specialty out of 'bumper fractures,' breaking the two bones in the lower leg. It's very painful but they do it. Somehow they never get hit by old, cheap cars." Katori said that about ninety people died out-of-doors last year in Sanya, mainly in the winter. The city government's estimate is only half that high, but considering how many of Sanya's men are old and sick, either figure seems low. It is very easy to imagine life ebbing out of those motionless forms.

Alcoholism and unemployment are of course universal problems, but Sanya's plight has a peculiarly Japanese edge. Even Katori, no one's idea of a typical salaryman, described the day laborers' plight through such familiar concepts as group identity, preserving face, stoic self-control. "Their philosophy is, don't look ahead, don't look back, just live for today. When they have money, they will gamble it or drink it. One man, who is now dead, worked for three months on a construction project in Akita Prefecture. The day it was over, he took a taxi back to Sanya." This extravagant gesture, equivalent to taking a taxi from Chicago to New York, used up all his earnings. Katori urges the Tokyo government to build better clinics, he laments the closing of the mines, he wishes other Japanese would pay more attention to Sanya. But finally, he said, the solution is for each individual to resist temptation and do his duty again.

He also offered a Japanese interpretation of why that was so hard. "They would like to go home. There everyone has a place at the table. But after five or ten years they lose their place. They want to come back, but to do it in the daylight—that would be too harsh. Everything would be too clear. So they come back at night. They come to the window and take a look in at the family they have left. But then—they see their reflection in the mirror, and they are too ashamed. They cannot go in and take their proper place again. They have let all the others down."

—James Fallowes



EDUCATION HOME SCHOOLING

Parents who educate their children at home face little official opposition—but a very demanding responsibility

PERHAPS NO SINGLE college acceptance has ever been the source of such widespread jubilation as that of Grant Colfax, in the spring of 1983. When this teenager from rural California was offered a place in Harvard's incoming freshman class (he was also admitted to Yale), several hundred thousand interested observers regarded the event as a vindication. The reason was that Grant's learning to that point had taken place almost exclusively at home. As though setting out to replicate the childhoods of historical heroes, he studied English and science by the light of a kerosene lantern—when he wasn't feeding animals, building sheds, or chopping wood on the family's fifty-acre farm.

Grant's admission to an Ivy League school—he was graduated, in biology, from Harvard last year with high honors and a Fulbright scholarship to study livestock in New Zealand—made an irresistible human-interest story for the network news and at least one weekly tabloid. But it was also a milestone for the home-school movement, whose proponents and visibility continue to increase.

Those who choose to educate their

own children fall, roughly speaking, into two camps, each with its own ideology, newsletter, and nearly legendary standard-bearer. Holt Associates, founded by the late education critic John Holt, in Boston, is heir to the alternative-school movement. Those who receive the bi-monthly *Growing Without Schooling*, which still features reminiscences about Holt and scraps of prose by him, are likely to be skeptical of institutions. The group's libertarian inclinations are tempered by a mostly secular New Age progressivism. The newsletter is sprinkled with references to the likes of Ivan Illich and Paul Goodman.

What Holt is to the Growers, Ray Moore is to the fundamentalist-Christian home-schoolers, who find public education unfit by virtue of its godlessness. Where Holt talks of trusting children to learn without adult interference, Moore emphasizes the importance of family values, which he believes are endangered by a socialistic state. Moore's Hewitt Research Foundation and curriculum supply center, in Washougal, Washington, puts out *The Parent Educator and Family Report*, which, like its secular New England counterpart, is filled with letters from readers. Its tone is decidedly different, though. "Are all public schools bad?" Moore asks rhetorically in one recent issue. "Hardly. Some are headed and staffed by consecrated Christians."

Partly because some home-schoolers try to lie low to avoid facing truancy charges, and partly because the movement is by its nature decentralized, no one can say with any certainty how many

parents are now teaching their own children. When Holt was alive (he died in 1985), he put the number in the low five figures but admitted that this represented a tactical decision: he chose to underestimate the movement's significance so as not to scare the educational establishment into reaction. Moore, if anything, errs on the side of hyperbole, insisting that at least a million children are being educated at home, including the handicapped and those who are part of migrant families.

A more reasonable guess comes from Patricia Lines, a policy analyst for the U.S. Department of Education and an acknowledged expert on the subject. In a 1985-1986 survey she counted about 50,000 subscribers to various curriculum services that provide home-schoolers with teaching materials. If one assumes that this represents something like a quarter of all those learning at home—which comports with the results of a poll taken by the Home School Legal Defense Association, in Great Falls, Virginia, and if one also assumes that Lines missed some suppliers and that more parents have taken their children out of conventional public or private schools since her survey, then the result is a current estimate of between 200,000 and 300,000. That number could be off the mark, but no one has been able to devise a more precise method for arriving at any other.

The estimation process is complicated by a high turnover rate. A private survey conducted in Washington state found that two thirds of all home-schooled children had been in that situation for two years or less, while a Florida survey found that only 30 percent of the students learning at home had done so during the previous year. Theoretically, such figures could simply reflect a new surge of popularity for home schooling, but the evidence available, most of it anecdotal, suggests that an interest in the practice is often short-lived. "The national average is that home-schoolers last one year," says James Prichard, who produces lesson plans for Accelerated Christian Education, a Texas firm. "They find out it's not what the parents thought it was, or the parents must go back to work or something."

Bearing the sole responsibility for educating one's children—answering their questions, monitoring their progress, boning up on a range of subjects, finding appropriate texts, planning the lessons every day—can be daunting. For

a working parent, it is obviously impractical; for anyone, it is likely to be more difficult than it appears. For every home-schooled child there are approximately twenty in private schools and 160 in public schools. Moreover, hardly anyone imagines that the practice will ever constitute a real threat to the jobs of professional educators.

The difficulties notwithstanding, an apparently growing number of parents keep at it. A handful of private and state-sponsored studies done in recent years offer some information about who home-schoolers are. They are far more numerous in the West and South than elsewhere. The typical home-school family is middle-class and white, and at least one of the parents has some college education. In something like nine out of ten such households the mother does most of the teaching. Boys and girls are equally likely to be taught at home.

Parents choose to keep their children out of conventional schools for a variety of reasons. Some just don't want to give up their children for the better part of the day. Often the parents have what the libertarian author Stephen Arons calls "an unarticulated feeling that the child belong[s] at home and not in an institution." Some parents conclude that their children, whose actual contact with a public-school teacher may amount to only a few minutes a day, are unlikely to receive an adequate education in the public schools. (Thus, when pressed by school superintendents as to whether they are really teaching their own children six hours a day, they will reply, with Holt: "Who's teaching them six hours a day in the classroom?")

Though many home-schoolers are disenchanted with what conventional classroom teaching offers, the members of the two camps disagree about the source of the problem. Holtians are likely to complain about rigid, autocratic, standardized procedures and a lack of opportunity for questioning and hands-on learning. Ray Moore, in contrast, speaks of parents who are "sick and tired of the teaching of evolution in the school as a cut-and-dried fact," along with other evidence of so-called secular humanism. These parents want more structure, not less, and they are therefore more likely to use curriculum services than are the readers of *Growing Without Schooling*. Of the 50,000 parents using such services, according to Lines, all but about 8,000 have chosen providers that are explicitly Christian. The workbooks supplied by

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Accelerated Christian Education are based exclusively on memorizing facts and taking fill-in-the-blank tests. Religious themes are woven through all subjects: eighth-grade math students, for example, are asked to construct a bar graph of the number of Scripture verses a hypothetical person memorizes each month.

That the preponderance of home-schoolers are motivated by religious concerns is suggested by the relative size of the Holt and Moore mailing lists: approximately 5,000 and 30,000, respectively. The group that has been established to defend home-schoolers in court, the Home School Legal Defense Association, is a Christian organization. Its founder, Michael Farris, also represents creationists and other fundamentalists on different educational issues. Both Farris and the National Association of State Boards of Education estimate that religion—usually Christianity—is the prime incentive for 90 percent of home-schoolers. Others, including Moore and Lines, think this figure is high, but few surveys have addressed the question directly.

THE PARENTS WHO are home-schoolers can be found anywhere along a continuum of educational philosophies, stretching from a free-form, non-directive approach to a regimented, almost institutional style of teaching.

Grant Colfax and his younger brothers Drew and Reed emerged from the non-directive end of the spectrum. "We didn't try in any way to mimic the public schools—it was more or less what the boys were interested in," Micki Colfax, fifty, explained in her Boonville, California, kitchen one morning while she eviscerated a chicken. The Colfaxes used no set curriculum, no tests, no deadlines. History and mathematics might be put on hold for six months while the boys studied science. But the word *study* seems inappropriate for describing much of what happened on the Colfax farm. Things needed to be done, the children had to do them, and learning simply happened along the way. After the family had lived for years without telephone service, Grant and his brothers cleared a path through the forest and installed a phone line themselves. The family wanted a guesthouse, so Drew and Reed, aged sixteen and fourteen at the time, figured out how to build one from the ground up. These projects, of course, offered intensive lessons in

mathematics, engineering, and other applied sciences, and regular studies were suspended while they were under way. Micki Colfax estimates that the boys spent an average of two or three hours a day doing something that resembled formal schooling—a period that increased threefold on rainy days.

This estimate, however, does not include countless hours of independent reading. Micki and her husband, David, rarely watch television, but they do read books. Their sons regularly supplemented the sizable family collection with full armloads from the local library. The Colfaxes subscribe to twenty magazines, and reading matter is piled up in the bathroom, the kitchen, and the bedrooms. Micki and David finally had to ban reading at dinner in favor of discussions about current events and literature. Despite—or perhaps because of—the absence of formal reading lists and exams, Grant had read all of Dickens by the time he was thirteen, and Drew had read all of Twain by that age. "The parents' job is largely one of pointing them in the right direction and being available when they have questions," David Colfax says. The Colfaxes have summarized their experiences and outlined their teaching methods in a book titled *Homeschooling for Excellence*, available from Mountain House Press, in Philo, California.

Carol Prudhon, who is teaching her six-year-old son and eight-year-old daughter in their Evansville, Wisconsin, home, sees her role differently. Her children's day begins promptly at 8:30 with the Pledge of Allegiance. They practice the violin, study reading and math for thirty minutes each, and stop briefly for a snack. Then come spelling, phonics, creative writing, science, and penmanship. The afternoon is for reading aloud, social studies, and special projects. The children also help around the house: baking bread, sorting laundry, and gardening. Each fall Prudhon sketches the year's curriculum; every Sunday night she writes her lesson plans for the next week. "Some people say I'm too regimented, but I'm getting great results," she says. "Some people drop everything when there's a bird on the windowsill and make birds their science lesson for the day. I think that's ridiculous."

Prudhon subscribes to Ray Moore's service and estimates that it accounts for 90 percent of her curriculum. She takes her children to weekly meetings with fifteen other local Christian home-

schooling families for such enrichments as art, music, and storytelling. All but a few of these families base their teaching on one or another curriculum service, and the religious subtexts of those materials are typically supplemented by homegrown Bible lessons.

For Peter Bergson and Susan Shilcock, who are home-schooling their four children in Bryn Mawr, Pennsylvania, learning is a function of neither construction projects nor prescribed texts. "Our children's lives involve massive amounts of what the outside world would call play," says Bergson, who makes his living as an educational consultant. "We challenge the distinction between work and play." Instead of just playing house, his children have set up an elaborate community of dolls, which involves publishing a newspaper (*The Dolltown Daily News*) and running a mail system for them. This, of course, entails work on writing and spelling skills. Interaction with the outside world is not neglected, however. At age seven, one daughter opened up her own bakery, shopping for ingredients, printing advertisements, and earning very real money—kept in her own checking account—for her muffins and cookies.

That the children have supplied the initiative and the ideas for most of their activities is no coincidence. "Home schooling provides more of an opportunity to continue the natural learning process that's in evidence in all children," Bergson says. In the classroom "you change the learning process from self-directed to other-directed, from the child asking questions to the teacher asking questions. You shut down areas of potential interest."

As the Colfaxes do, Bergson and his wife keep hundreds of books around to be opened at will. At an early age and without any parental pressure, Amanda, now eleven, became a prolific reader. She was "going through them so quickly I assumed she was just skimming them," Bergson says. But a few questions quickly demonstrated her remarkable retention. Formal testing is eschewed by Bergson and by most home-schoolers, because, they say, it is unnecessary. As Carol Prudhon puts it, "By working with them every day, I know what they know."

IN THE CASE OF Grant and Drew Colfax, Harvard University was apparently satisfied with what they knew, and what they were capable of learning. The



fact that Grant and Drew, who is now in his sophomore year at Harvard, are outspokenly irreligious has not prevented Ray Moore and other Christians from trading on their successes. "We're often being used as examples by people whose philosophy we reject and abhor—fundamentalist, holy-roller types," Grant says. "As a biology major, I studied the very stuff they're taking their kids out of school to avoid."

Grant's acceptance by Harvard and Yale, and Drew's by those schools and also Princeton, Amherst, and Haverford, is obviously welcome news for home-schoolers of all stripes. Interviews and board scores naturally assume more significance in the absence of a grade-point average (Grant's and Drew's SAT scores were quite good, both in the mid-1300s), but most admissions officers "will work with anything when a student presents credentials, and no student would be discounted" because he was home-schooled, according to R. Russell Shunk, the president of the National Association of College Admission Counselors.

As for broader indicators of the success of home schooling, controlled studies on achievement are in short supply. Susannah Sheffer, the editor of *Growing Without Schooling*, grins when she is asked for data. "See, home-schoolers hate that. They tend not to believe that earning can be measured—especially by standardized tests." She and other proponents offer anecdotal accounts of children who flailed and failed in the classroom but flourished when taught at her kitchen table.

The few hard numbers that do exist—virtually all of them collected in the past few years—are uniformly positive. Studies conducted by the Departments of Education in Alaska, Washington, and Tennessee indicate that the average home-schooled student outperforms his or her traditionally schooled counterpart across the board. Brian D. Ray, a doctoral candidate at Oregon State University, has been collecting all the research on the subject he can get his hands on for an academic quarterly newsletter he edits called *Home School Researcher*. His data corroborate the state studies, showing that the great majority of home-schooled students score above average on achievement tests. "I've seen no evidence that they tend to be weak in any areas," Ray says. This conclusion is echoed by Lines and others.

In Woodinville, Washington, a high school guidance counselor and amateur researcher named Jon Wartes undertook his own study. He sorted through the Stanford Achievement scores of all home-schooled students in the western part of the state who had taken the test in 1986, and compared those scores with national norms. With the single exception of first graders' performance in math, where home-schooled children scored in the forty-ninth percentile, those who were taught by their parents were above the 50 percent mark at every grade level and in every subject. In reading the median score of home-schooled children was at the sixty-seventh percentile, in listening-comprehension skills at the seventy-sixth. "One could speculate that home-schoolers as a

group are very nurturing, caring parents," Wartes says. "Perhaps [their children] spent a lot of time being read to on their parents' laps."

Critics of home schooling are concerned about more than academic achievement, however. They fear for the social development of children deprived of the company of their peers. David Johnson, a social psychologist who teaches at the University of Minnesota, has found that children in competitive classrooms have lower self-esteem than those who learn cooperatively but that those who learn individually are in the worst shape of all. "Any kid who's isolated is in real danger," Johnson says. He pronounces home schooling a "bad idea," because it takes children away from their peer group. "If [parents] knew the data, they wouldn't do it."

To this criticism home-schooling proponents have two standard responses. First, they insist that the reality of a child's social life at school is, if anything, a good argument for home schooling. The conservative Christians talk about the importance of being socialized by family members rather than by undesirables in the school yard. Holt, in his book *Teach Your Own*, offers a different version of the same argument: "In all but a very few of the schools I have taught in, visited, or know anything about, the social life of the children is mean-spirited, competitive, exclusive, status-seeking, snobbish. . . ."

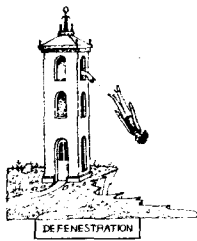
Second, the home-schoolers reply that their children are not social isolates; they interact regularly with other children in extracurricular and recreational activities. In the Washington survey two thirds of home-schoolers said they usually or always scheduled time during the day for their children to play with others. About the same proportion told Jon Wartes that their children spent at least twenty hours a month with other children. The only research on non-achievement variables, conducted by John Wesley Taylor V in 1986, found that half of a random sample of 224 home-schooled children scored at or above the ninety-first percentile on the Piers-Harris Children's Self-Concept Scale, a psychological test that measures self-esteem, while only 10 percent were below the national average.

Upon arriving at Harvard, neither of the Colfax brothers found the social scene any more intimidating than did their fellow freshmen—which is to say, it was a challenge to almost everyone in

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their classes. In fact, Drew says, being home-schooled, "you don't know how nervous you *should* be." When he heard about what others had experienced in high school, he was anything but envious. "All the games people had to play, the mind-trips the teachers played, the whole social scene at high school, sounds really pathetic. I feel very lucky that I avoided all that." Four-H Club meetings aside, Drew acknowledges that he had little day-to-day interaction with kids his own age as he was growing up, "but it wasn't like we were lonely or deprived." As for encounters with the opposite sex, his older brother says, "There was one romantic interlude before I got here, then I made up for lost time, and that's all I'm going to say."

IN PLACE OF straightforward nation-
wide guidelines, parents who seek
permission to teach their children at
home face a bewildering array of state
laws, district standards, and contradic-
tory court decisions. Home schooling is
not absolutely illegal anywhere in the
country, and many states have enacted
legislation over the past few years that
has made the practice easier to pursue
legally. In Missouri a parent who files a
notice of intent essentially cannot be re-
fused permission. In North Dakota,
Iowa, and Michigan, in contrast, only
certified teachers can be home-
schoolers. Other states require children
to pass standardized achievement tests
or receive instruction comparable to that
in public schools. In some states home
schooling is permissible if one goes
through the formality of declaring one's
home to be a private school.

Considerable disparities are likely to
be found in home-schooling require-
ments even within a given state. One
school district may offer resources and
assistance to home-schoolers, while a
neighboring district goes to court to
keep a child in school. What's more, a
single area may give mixed signals. Al-
though Iowa's law is among the most re-
strictive in the nation, Des Moines has
instituted an innovative home-instruction
program in which visiting teachers over-
see the education provided by parents.

While judges in at least five states
have over the past few years cited the
vagueness of home-schooling laws as
grounds for striking them down, litiga-
tion on the issue has, if anything, com-
pounded the confusion. Home-school-
ing advocates like to cite the 1972
Supreme Court decision *Wisconsin v.*

Yoder, which allowed a religious excep-
tion to compulsory schooling after
eighth grade for the Amish, but the high
court has never ruled on home schooling
per se. Most school districts that threat-
en to sue parents over the issue end up
resolving the case out of court, though
the record is mixed for those cases that
do go before a judge. "The lawyers on
both sides can find precedent to support
the arguments they're going to make,"
says Cheryl Karstaedt, an assistant attor-
ney general in Colorado who has re-
searched the subject. "It depends on the
circumstances of the particular case
and—though I dislike saying it—the
personalities involved." The same
seems to be true for those home-
schoolers who, rather than wait to be
dragged into court for violating truancy
laws, have taken the initiative to sue. As
plaintiffs, home-schoolers argue that ap-
proval requirements violate their civil
rights, that equal protection under the
law is violated when regulations are not
applied uniformly, and that religious
freedom supersedes compulsory-atten-
dance laws.

Taken together, several recent, well-
publicized cases illustrate the judicial in-
consistency that both sides face. In
March of last year Massachusetts's high-
est court fashioned a compromise: a
Christian couple had the right to teach
their own children, but the school dis-
trict had the right to review their curricu-
lum. Virginia courts, meanwhile, were
finding against home-schoolers in two
cases, ruling in one of them that un-
trained parents could not legally treat
their home as a private school. However,
a Texas judge handed the movement a
whopping victory last year in *Leeper, et
al. v. Arlington Independent School District*,
which made it almost impossible for a
school district to refuse permission to
home-schoolers or even to make permis-
sion conditional on test scores.

Michael Farris, whose five-year-old
Home School Legal Defense Associ-
ation has 7,000 member families, who
pay \$100 a year for protection and ad-
vice, is worried now about a rather dif-
ferent case he lost. Last August a federal
appeals court ruled in *Mozert v. Hawkins
County Public Schools* that a group of fun-
damentalists Christians in Tennessee
could not keep their children out of par-
ticular classes just because they found
godless influences in the textbooks. Far-
ris expects to hear this ruling cited soon
by school districts in home-schooling
cases. If the First Amendment's protec-

tion of the free exercise of religion "doesn't allow you to opt out of instruction that violates your religious beliefs," he predicts prosecutors will argue, "it doesn't matter whether it's part of the day or all of the day." If you can't reject a textbook, in other words, how can you reject formal schooling altogether?

DESPITE THE COURTROOM battles in which home-schoolers and their advocates often find themselves, they face no organized national opposition. Responses from the educational establishment range from indifference to low-key wariness. The idea itself is unobjectionable, educators frequently argue, but not all parents can be trusted to teach their children adequately. The right of parents to yank their kids out of school must be weighed against the state's obligation to make sure that those children are really learning something.

"We're not saying a parent doesn't have the right to keep a child at home, but a child has to be able to meet certain academic requirements," says Mary Furell, the president of the National Education Association. In 1984 the NEA approved a policy statement that acknowledged the reality of home schooling but recommended that home-schoolers demonstrate their competence as teachers, request permission every year, submit to extensive monitoring by local school administrators, comply with attendance laws having to do with the amount of time children should spend in school, have their children tested regularly, and so on. Having made its position known, the NEA has seen no need to take further action or to campaign against home-schooling laws.

The National Association of Elementary School Principals came out flatly against home schooling in its platform for the current school year. "The kind of arguments we're hearing are the same kind we were hearing when we were integrating schools: rights under the First and Fourteenth amendments," says Sam Java, the group's executive director. "The problem is that many home-schoolers don't want to ask *anyone's* permission. They think it's their right under the Constitution." But the organization is not mobilizing to act on its policy statement, which fills two dozen lines in the forty-three-page platform.

If anyone is directly challenging the right of parents to teach their children, it's not teachers and principals but school boards. August Steinhilber, the general

counsel to the National School Boards Association, calls home schooling a "small issue" and denies that any of his constituents is afraid it will grow to the point that public-school funding could be jeopardized. Why, then, are parents being prosecuted? "We have a responsibility to make sure [children] are being properly educated," he says.

Virginia Roach, a project director at the National Association of State Boards of Education, takes a conciliatory position. "The school boards don't want to be in court or in the papers any more than the parents want to be," she says. They "look for ways to work together instead of [pursuing] an automatically adversarial relationship," but because a few parents on the fringes do not adequately educate their children, NASBE doesn't think that standardized testing or review of curriculum is unreasonable. Officially NASBE is committed only to clarifying home-schooling laws so as to eliminate confusion about what is permitted and what is required.

Home-schoolers themselves are divided on how much regulation is reasonable. Farris, who considers home-schoolers to be competing with public-school systems, says that requiring approval from school boards is "like saying to Avis you can rent a car if you get Hertz's approval." As for permitting children to continue in home schooling only if their performance on achievement tests meets some arbitrary standard, Farris says fine—providing the same standard is applied to children in public schools. In his book *Compelling Belief: The Culture of American Schooling*, Stephen Arons argues that the legal restrictions have less to do with concern that home-schooled children will suffer than with educators' defensiveness about the tacit message of home schooling. "When a family seeks approval of a home-education plan from a public authority, it is implicitly challenging the professionalization of education," he writes. "Many educators seem to regard their occupational survival as dependent upon their insistence that they, and only they, can adequately define, create, and judge quality education."

But some home-schoolers are not terribly interested in affirming their inherent right to educate their children as they see fit. They simply want to get on with the process, and are happy to check in with the authorities if this means they will be able to teach their own.

—Alfie Kohn

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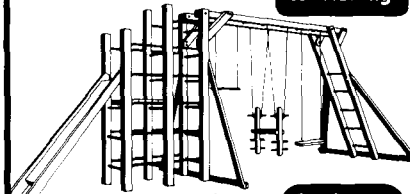
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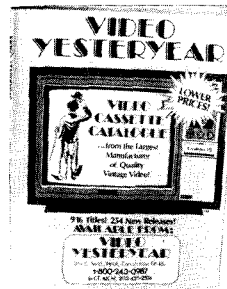
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sought the company of coyotes, or a mule. Mature, sophisticated, outdoorsy, he has been mentioned in the memoirs of such notables as Pecos Bill, Victor Hugo, Oscar Wilde, Little Egypt, and the Smith Brothers. To those of you who insist on sending recipes, how about some for biscuits, or rabbit stew? I hope soon to be doing some research out in the country.

3rd Notice

WOULD WELCOME ANY ACCURATE accounts of Bill Rivers's deeds; neatness counts. Many turn to his own work, *Natural History of These Western Territories* (Mule Press, 1843), full of animal descriptions he calls "autobiographical," such as "The Wolf Crow: A forlorn beast, said to pounce on rabbits, then hesitate, prey in jaws, longing for wings to beat to the treetops to feast." Or "The Ice-Fish: This species thrives in Arctic waters, but tends to melt when warmed at a fire, or brought into igloos. Not a very good eating fish." Other accounts, more susceptible to interpretation, come from old-timers, who say he used to cook "damn good" biscuits, draw skilled maps of territories by listening to the barking of coyotes at night, and round up stray rivers with a lasso when they failed to fit his maps; was hung three times and shot once or twice; and used to slide down lightning bolts hollering and wrestling eight wildcats without getting any splinters, and lease his

name at twenty dollars a year to dozens of imitators who then followed the carnival and minstrel circuits, performing daredevil feats and "trick" knitting. If you have any helpful recollections of Bill Rivers's doings; have ever tasted an ice fish; own any old photos, a pair of muddy trousers worn by Bill Rivers, or a hoe used by same to dig potatoes; or ever want to see your children alive again, let's talk.

4th Notice

WOULD WELCOME THOUGHTS from colleagues about the hardships of the biographer's trade, tips on filing (documents), and ways to avoid lawsuits from ungrateful subjects. Lately I've taken my work to the country, where I've kept busy building a smokehouse and spending time at a salt lick. Supplies of sorghum and pepper are a bit low. I now suspect that the best method to write the Bill Rivers biography is on my coat, as I wear it every day, and it gets stiff with sweat, smoke, sun, wind, and other elements, such as dirt. Don't have time for the usual research, such as studying documents, visiting rare-book dealers, or dating librarians, as I have been tramping around, seeking out leads from coyotes, prairie dogs, and several nearby mules. I would welcome suggestions on the best way to prepare a coat for publication; any low-cal recipes that call for the use of beans; also supplies of sorghum or pepper. □



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PROFESSION: Composer; multi-instrumentalist; inventor of the hubkaphone; leader, Henry Threadgill Sextett.

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LAST BOOK READ: *Silence*, John Cage.

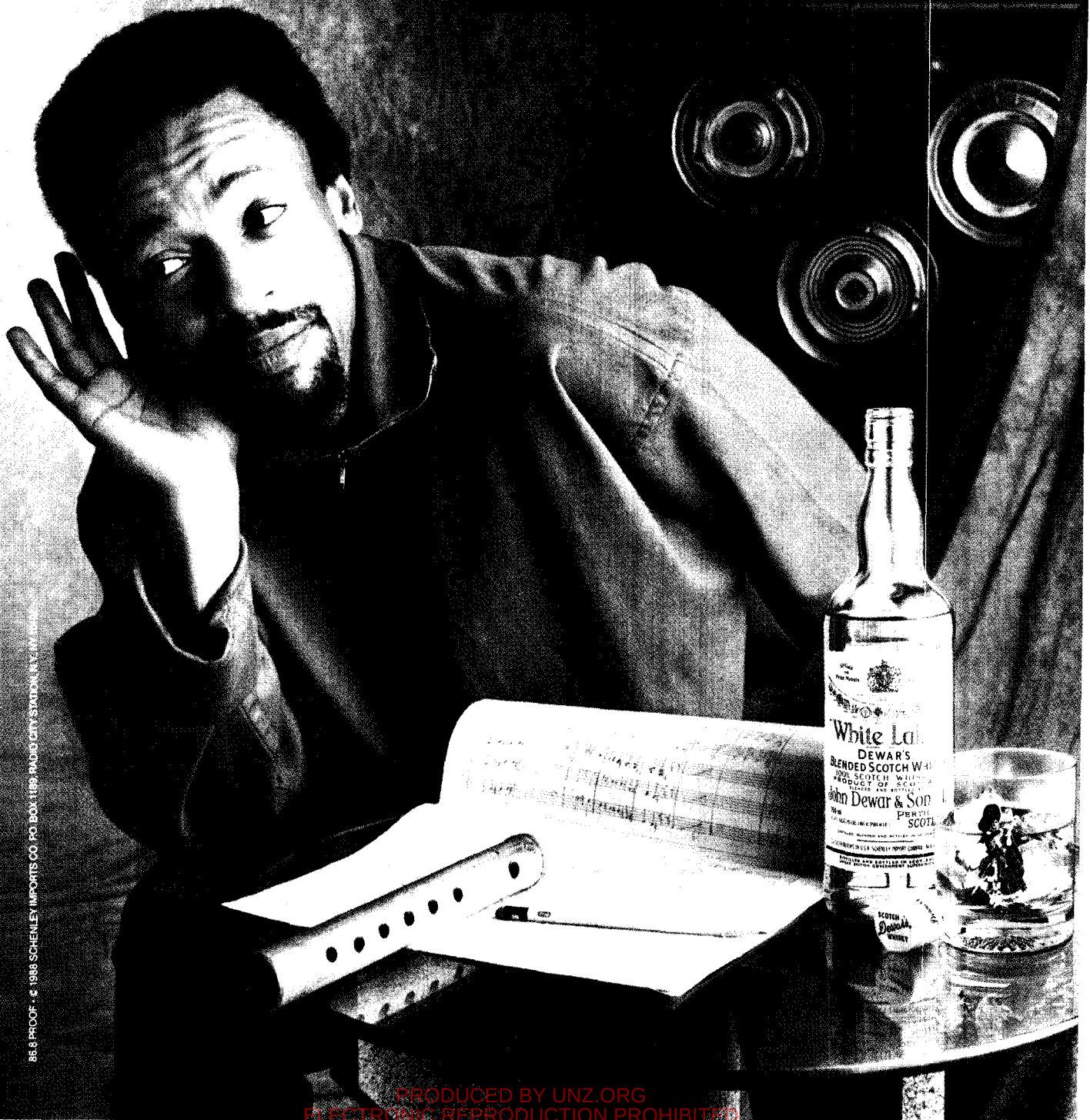
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QUOTE: "Tradition is a background of ingredients; in itself it's nothing. If you can't make something out of it, the world can do without it."

PROFILE: Intuitive, strong and as sharp an observer of his fellow man as his music would lead you to think.

HIS SCOTCH: Dewar's "White Label" "on the rocks, after the music stops."



Edward Fredkin's theory is one not just of physics but of metaphysics: it leads to speculation about supreme beings and the purpose of life

DID THE UNIVERSE JUST HAPPEN?

BY ROBERT WRIGHT



I. Flying Solo

ED FREDKIN IS SCANNING THE VISUAL FIELD SYSTEM-atically. He checks the instrument panel regularly. He is cool, collected, in control. He is the optimally efficient pilot.

The plane is a Cessna Stationair Six—a six-passenger single-engine amphibious plane, the kind with the wheels recessed in pontoons. Fredkin bought it not long ago and is still working out a few kinks; right now he is taking it for a spin above the British Virgin Islands after some minor mechanical work.

He points down at several brown-green masses of land, embedded in a turquoise sea so clear that the shadows of yachts are distinctly visible on its sandy bottom. He singles out a small island with a good-sized villa and a swimming pool, and explains that the compound, and the island as well, belong to “the guy that owns Boy George”—the rock star’s agent, or manager, or something.

I remark, loudly enough to overcome the engine noise, “It’s nice.”

Yes, Fredkin says, it’s nice. He adds, “It’s not as nice as my island.”

He’s joking, I guess, but he’s right. Ed Fredkin’s island, which soon comes into view, is bigger and prettier. It is about 125 acres, and the hill that constitutes its bulk is a deep green—a mixture of reeds and cacti, sea grape and turpentine trees, machineel and frangipani. Its beaches range from prosaic to sublime, and the coral in the waters just offshore attracts little and big fish whose colors look as if they were coordinated by Alexander Julian. On the island’s west side are immense rocks, suitable for careful climbing, and on the east side are a bar and restaurant and a modest hotel, which consists of three clapboard buildings, each with a few rooms. Between east and west is Fredkin’s secluded island villa. All told, Moskito Island—or Drake’s Anchorage, as the brochures call it—is a nice place for Fredkin to spend the few weeks of each year when he is not up in the Boston area tending his various other businesses.

In addition to being a self-made millionaire, Fredkin is a

self-made intellectual. Twenty years ago, at the age of thirty-four, without so much as a bachelor's degree to his name, he became a full professor at the Massachusetts Institute of Technology. Though hired to teach computer science, and then selected to guide MIT's now eminent computer-science laboratory through some of its formative years, he soon branched out into more-offbeat things. Perhaps the most idiosyncratic of the courses he has taught is one on "digital physics," in which he propounded the most idiosyncratic of his several idiosyncratic theories. This theory is the reason I've come to Fredkin's island. It is one of those things that a person has to be prepared for. The preparer has to say, "Now, this is going to sound pretty weird, and in a way it is, but in a way it's not as weird as it sounds, and you'll see this once you understand it, but that may take a while, so in the meantime don't prejudge it, and don't casually dismiss it." Ed Fredkin thinks that the universe is a computer.

Fredkin works in a twilight zone of modern science—the interface of computer science and physics. Here two concepts that traditionally have ranked among science's most fundamental—matter and energy—keep bumping into a third: information. The exact relationship among the three is a question without a clear answer, a question vague enough, and basic enough, to have inspired a wide variety of opinions. Some scientists have settled for modest and sober answers. Information, they will tell you, is just one of many forms of matter and energy; it is embodied in things like a computer's electrons and a brain's neural firings, things like newsprint and radio waves, and that is that. Others talk in grander terms, suggesting that information deserves full equality with matter and energy, that it should join them in some sort of scientific trinity, that these three things are the main ingredients of reality.

Fredkin goes further still. According to his theory of digital physics, information is *more* fundamental than matter and energy. He believes that atoms, electrons, and quarks consist ultimately of bits—binary units of information, like those that are the currency of computation in a personal computer or a pocket calculator. And he believes that the behavior of those bits, and thus of the entire universe, is governed by a single programming rule. This rule, Fredkin says, is something fairly simple, something vastly less arcane than the mathematical constructs that conventional physicists use to explain the dynamics of physical reality. Yet through ceaseless repetition—by tirelessly taking information it has just transformed and transforming it further—it has generated pervasive complexity. Fredkin calls this rule, with discernible reverence, "the cause and prime mover of everything."

AT THE RESTAURANT ON FREDKIN'S ISLAND THE FOOD is prepared by a large man named Brutus and is humbly submitted to diners by men and women native to nearby islands. The restaurant is open-air, ventilated by a sea breeze that is warm during the day, cool at

night, and almost always moist. Between the diners and the ocean is a knee-high stone wall, against which waves lap rhythmically. Beyond are other islands and a horizon typically blanketed by cottony clouds. Above is a thatched ceiling, concealing, if the truth be told, a sheet of corrugated steel. It is lunchtime now, and Fredkin is sitting in a cane-and-wicker chair across the table from me, wearing a light cotton sport shirt and gray swimming trunks. He was out trying to windsurf this morning, and he enjoyed only the marginal success that one would predict on the basis of his appearance. He is fairly tall and very thin, and has a softness about him—not effeminacy, but a gentleness of expression and manner—and the complexion of a scholar; even after a week on the island, his face doesn't vary much from white, except for his nose, which is red. The plastic frames of his glasses, in a modified aviator configuration, surround narrow eyes; there are times—early in the morning or right after a nap—when his eyes barely qualify as slits. His hair, perennially semi-combed, is black with a little gray.

Fredkin is a pleasant mealtime companion. He has much to say that is interesting, which is fortunate because generally he does most of the talking. He has little curiosity about other people's minds, unless their interests happen to coincide with his, which few people's do. "He's right above us," his wife, Joyce, once explained to me, holding her left hand just above her head, parallel to the ground. "Right here looking down. He's not looking down saying, 'I know more than you.' He's just going along his own way."

The food has not yet arrived, and Fredkin is passing the time by describing the world view into which his theory of digital physics fits. "There are three great philosophical questions," he begins. "What is life? What is consciousness and thinking and memory and all that? And how does the universe work?" He says that his "informational viewpoint" encompasses all three. Take life, for example. Deoxyribonucleic acid, the material of heredity, is "a good example of digitally encoded information," he says. "The information that implies what a creature or a plant is going to be is encoded; it has its representation in the DNA, right? Okay, now, there is a process that takes that information and transforms it into the creature, okay?" His point is that a mouse, for example, is "a big, complicated informational process."

Fredkin exudes rationality. His voice isn't quite as even and precise as Mr. Spock's, but it's close, and the parallels don't end there. He rarely displays emotion—except, perhaps, the slightest sign of irritation under the most trying circumstances. He has never seen a problem that didn't have a perfectly logical solution, and he believes strongly that intelligence can be mechanized without limit. More than ten years ago he founded the Fredkin Prize, a \$100,000 award to be given to the creator of the first computer program that can beat a world chess champion. No one has won it yet, and Fredkin hopes to have the award raised to \$1 million.

Fredkin is hardly alone in considering DNA a form of information, but this observation was less common back when he first made it. So too with many of his ideas. When his world view crystallized, a quarter of a century ago, he immediately saw dozens of large-scale implications, in fields ranging from physics to biology to psychology. A number of these have gained currency since then, and he considers this trend an ongoing substantiation of his entire outlook.

Fredkin talks some more and then recaps. "What I'm saying is that at the most basic level of complexity an information process runs what we think of as physics. At the much higher level of complexity life, DNA—you know, the biochemical functions—are controlled by a digital information process. Then, at another level, our thought processes are basically information processing." That is not to say, he stresses, that *everything* is best viewed as information. "It's just like there's mathematics and all these other things, but not everything is best viewed from a mathematical viewpoint. So what's being said is not that this comes along and replaces everything. It's one more avenue of modeling reality, and it happens to cover the sort of three biggest philosophical mysteries. So it sort of completes the picture."

Among the scientists who don't dismiss Fredkin's theory of digital physics out of hand is Marvin Minsky, a computer scientist and polymath at MIT, whose renown approaches cultic proportions in some circles. Minsky calls Fredkin "Einstein-like" in his ability to find deep principles through simple intellectual excursions. If it is true that most physicists think Fredkin is off the wall, Minsky told me, it is also true that "most physicists are the ones who don't invent new theories"; they go about their work with tunnel vision, never questioning the dogma of the day. When it comes to the kind of basic reformulation of thought proposed by Fredkin, "there's no point in talking to anyone but a Feynman or an Einstein or a Pauli," Minsky says. "The rest are just Republicans and Democrats." I talked with Richard Feynman, a Nobel laureate at the California Institute of Technology, before his death, in February. Feynman considered Fredkin a brilliant and consistently original, though sometimes incautious, thinker. If anyone is going to come up with a new and fruitful way of looking at physics, Feynman said, Fredkin will.

Notwithstanding their moral support, though, neither Feynman nor Minsky was ever convinced that the universe is a computer. They were endorsing Fredkin's mind, not this particular manifestation of it. When it comes to digital physics, Ed Fredkin is flying solo.

He knows that, and he regrets that his ideas continue to lack the support of his colleagues. But his self-confidence is unshaken. You see, Fredkin has had an odd childhood, and an odd education, and an odd career, all of which, he explains, have endowed him with an odd perspective, from which the essential nature of the universe happens to be clearly visible. "I feel like I'm the only person with eyes in a world where everyone's blind," he says.



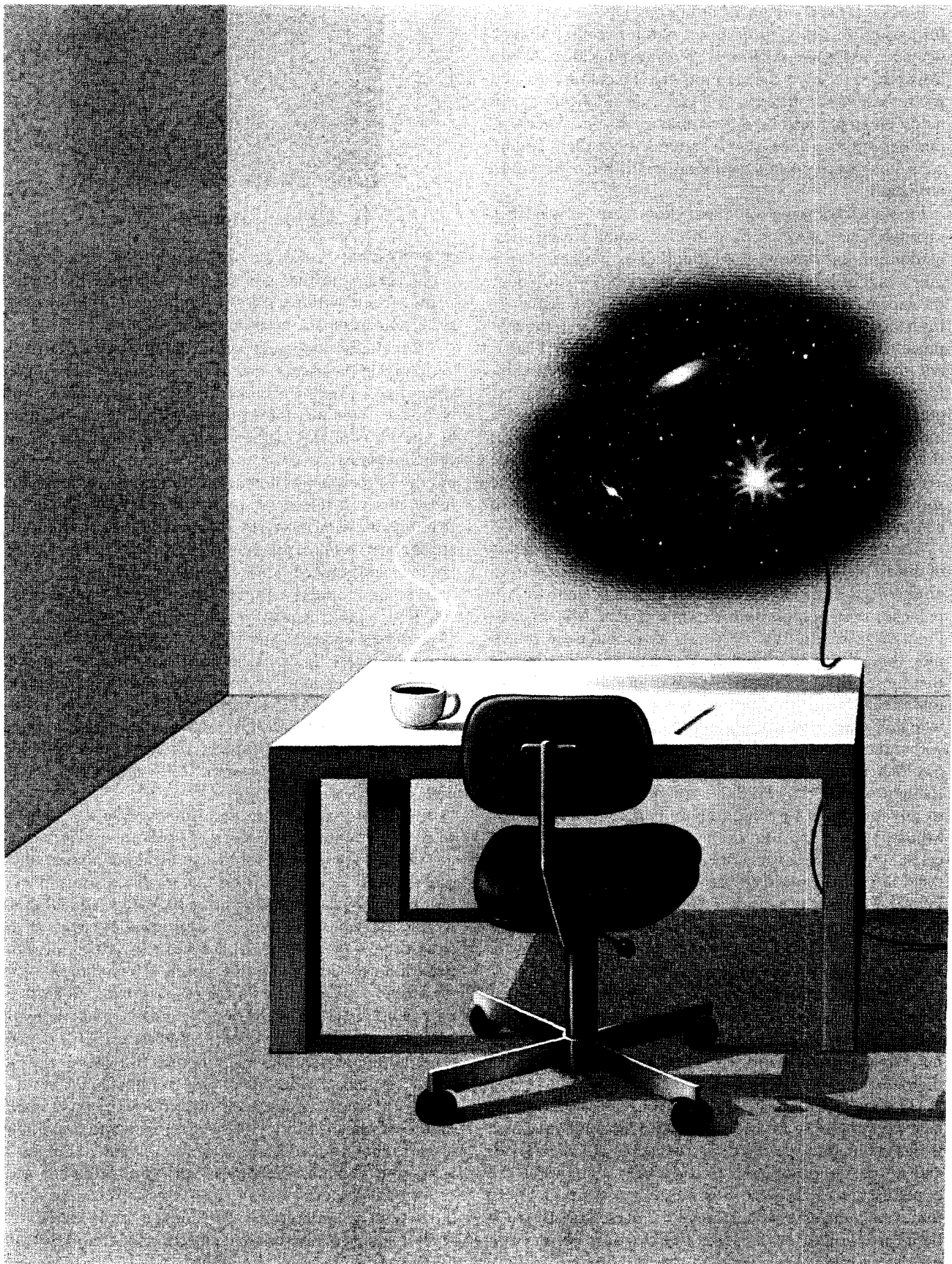
II. A Finely Mottled Universe

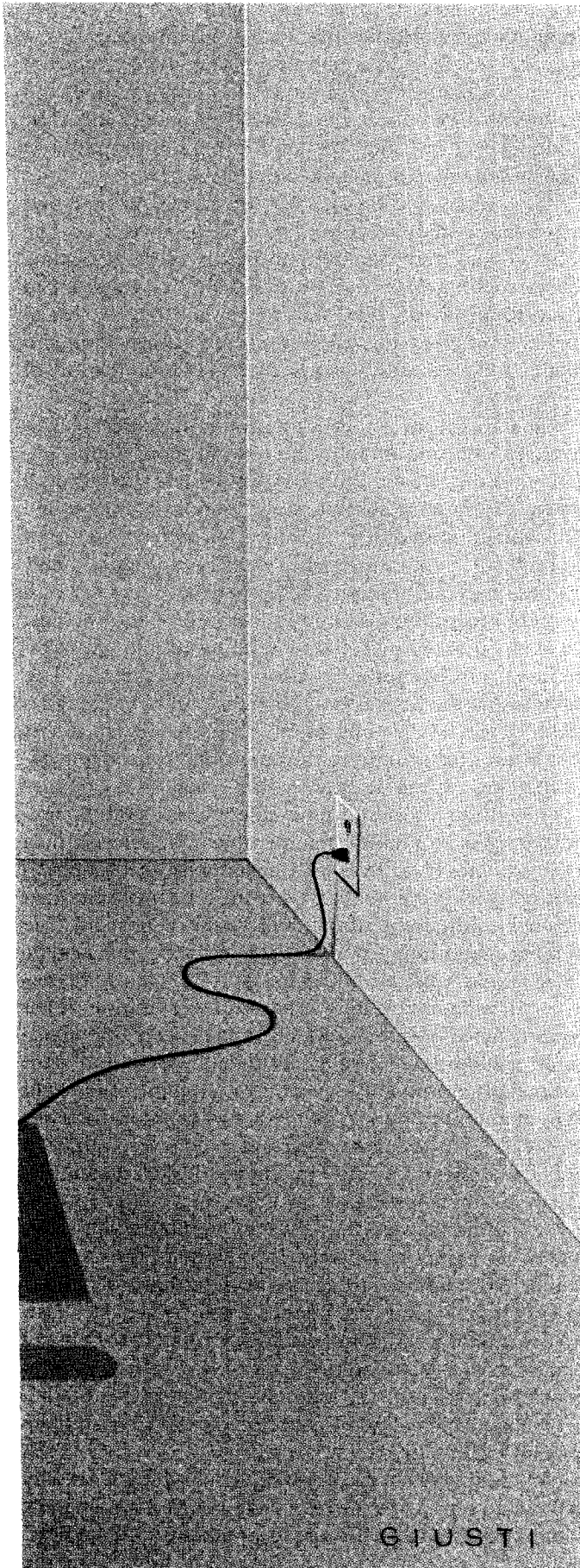
THE PRIME MOVER OF EVERYTHING, THE SINGLE principle that governs the universe, lies somewhere within a class of computer programs known as cellular automata, according to Fredkin.

The cellular automaton was invented in the early 1950s by John von Neumann, one of the architects of computer science and a seminal thinker in several other fields. Von Neumann (who was stimulated in this and other inquiries by the ideas of the mathematician Stanislaw Ulam) saw cellular automata as a way to study reproduction abstractly, but the word *cellular* is not meant biologically when used in this context. It refers, rather, to adjacent spaces—cells—that together form a pattern. These days the cells typically appear on a computer screen, though von Neumann, lacking this convenience, rendered them on paper.

In some respects cellular automata resemble those splendid graphic displays produced by patriotic masses in authoritarian societies and by avid football fans at American universities. Holding up large colored cards on cue, they can collectively generate a portrait of, say, Lenin, Mao Zedong, or a University of Southern California Trojan. More impressive still, one portrait can fade out and another crystallize in no time at all. Again and again one frozen frame melts into another. It is a spectacular feat of precision and planning.

But suppose there were no planning. Suppose that instead of arranging a succession of cards to display, everyone learned a single rule for repeatedly determining which card was called for next. This rule might assume any of a number of forms. For example, in a crowd where all cards were either blue or white, each card holder could be instructed to look at his own card and the cards of his four nearest neighbors—to his front, back, left, and right—and do what the majority did during the last frame. (This five-cell group is known as the von Neumann neighborhood.) Alternatively, each card holder could be instructed to do the opposite of what the majority did. In either event the result would be a series not of predetermined portraits but of more abstract, unpredicted patterns. If, by prior agreement, we began with a USC Trojan, its white face might dissolve into a sea of blue, as whitecaps drifted aimlessly across the stadium. Conversely, an ocean of randomness could yield islands of structure—not a Trojan, perhaps, but at least something that didn't look entirely accidental. It all depends on the original pattern of cells and the rule used to transform it incrementally.





This leaves room for abundant variety. There are many ways to define a neighborhood, and for any given neighborhood there are many possible rules, most of them more complicated than blind conformity or implacable nonconformity. Each cell may, for instance, not only count cells in the vicinity but also pay attention to which particular cells are doing what. All told, the number of possible rules is an exponential function of the number of cells in the neighborhood; the von Neumann neighborhood alone has 2^{32} , or around 4 billion, possible rules, and the nine-cell neighborhood that results from adding corner cells offers 2^{512} , or roughly 1 with 154 zeros after it, possibilities. But whatever neighborhoods, and whatever rules, are programmed into a computer, two things are always true of cellular automata: all cells use the same rule to determine future behavior by reference to the past behavior of neighbors, and all cells obey the rule simultaneously, time after time.

In the late 1950s, shortly after becoming acquainted with cellular automata, Fredkin began playing around with rules, selecting the powerful and interesting and discarding the weak and bland. He found, for example, that any rule requiring all four of a cell's immediate neighbors to be lit up in order for the cell itself to be lit up at the next moment would not provide sustained entertainment; a single "off" cell would proliferate until darkness covered the computer screen. But equally simple rules could create great complexity. The first such rule discovered by Fredkin dictated that a cell be on if an odd number of cells in its von Neumann neighborhood had been on, and off otherwise. After "seeding" a good, powerful rule with an irregular landscape of off and on cells, Fredkin could watch rich patterns bloom, some freezing upon maturity, some eventually dissipating, others locking into a cycle of growth and decay. A colleague, after watching one of Fredkin's rules in action, suggested that he sell the program to a designer of Persian rugs.

Today new cellular-automaton rules are formulated and tested by the "information-mechanics group" founded by Fredkin at MIT's computer-science laboratory. The core of the group is an international duo of physicists, Tommaso Toffoli, of Italy, and Norman Margolus, of Canada. They differ in the degree to which they take Fredkin's theory of physics seriously, but both agree with him that there is value in exploring the relationship between computation and physics, and they have spent much time using cellular automata to simulate physical processes. In the basement of the computer-science laboratory is the CAM—the cellular-automaton machine, designed by Toffoli and Margolus partly for that purpose. Its screen has 65,536 cells, each of which can assume any of four colors and can change color sixty times a second.

The CAM is an engrossing, potentially mesmerizing machine. Its four colors—the three primaries and black—intermix rapidly and intricately enough to form subtly shifting hues of almost any gradation; pretty waves of deep blue or red ebb and flow with fine fluidity and sometimes

with rhythm, playing on the edge between chaos and order.

Guided by the right rule, the CAM can do a respectable imitation of pond water rippling outward circularly in deference to a descending pebble, or of bubbles forming at the bottom of a pot of boiling water, or of a snowflake blossoming from a seed of ice: step by step, a single "ice crystal" in the center of the screen unfolds into a full-fledged flake, a six-edged sheet of ice riddled symmetrically with dark pockets of mist. (It is easy to see how a cellular automaton can capture the principles thought to govern the growth of a snowflake: regions of vapor that find themselves in the vicinity of a budding snowflake freeze—*unless* so nearly enveloped by ice crystals that they cannot discharge enough heat to freeze.)

These exercises are fun to watch, and they give one a sense of the cellular automaton's power, but Fredkin is not particularly interested in them. After all, a snowflake is not, at the visible level, *literally* a cellular automaton; an ice crystal is not a single, indivisible bit of information, like the cell that portrays it. Fredkin believes that automata will more faithfully mirror reality as they are applied to its more fundamental levels and the rules needed to model the motion of molecules, atoms, electrons, and quarks are uncovered. And he believes that at the most fundamental level (whatever that turns out to be) the automaton will describe the physical world with perfect precision, because at that level the universe *is* a cellular automaton, in three dimensions—a crystalline lattice of interacting logic units, each one "deciding" zillions of times per second whether it will be off or on at the next point in time. The information thus produced, Fredkin says, is the fabric of reality, the stuff of which matter and energy are made. An electron, in Fredkin's universe, is nothing more than a pattern of information, and an orbiting electron is nothing more than that pattern moving. Indeed, even this motion is in some sense illusory: the bits of information that constitute the pattern never move, any more than football fans would change places to slide a USC Trojan four seats to the left. Each bit stays put and confines its activity to blinking on and off. "You see, I don't believe that there are objects like electrons and photons, and things which are themselves and nothing else," Fredkin says. "What I believe is that there's an information process, and the bits, when they're in certain configurations, behave like the thing we call the electron, or the hydrogen atom, or whatever."

THE READER MAY NOW HAVE A NUMBER OF QUESTIONS that unless satisfactorily answered will lead to something approaching contempt for Fredkin's thinking. One such question concerns the way cellular automata chop space and time into little bits. Most conventional theories of physics reflect the intuition that reality is continuous—that one "point" in time is no such thing but, rather, flows seamlessly into the next, and that space, simi-

larly, doesn't come in little chunks but is perfectly smooth. Fredkin's theory implies that both space and time have a graininess to them, and that the grains cannot be chopped up into smaller grains; that people and dogs and trees and oceans, at rock bottom, are more like mosaics than like paintings; and that time's essence is better captured by a digital watch than by a grandfather clock.

The obvious question is, Why do space and time *seem* continuous if they are not? The obvious answer is, The cubes of space and points of time are very, very small: time seems continuous in just the way that movies seem to move when in fact they are frames, and the illusion of spatial continuity is akin to the emergence of smooth shades from the finely mottled texture of a newspaper photograph.

The obvious answer, Fredkin says, is not the whole answer; the illusion of continuity is yet more deeply ingrained in our situation. Even if the ticks on the universal clock were, in some absolute sense, very slow, time would still seem continuous to us, since our perception, itself proceeding in the same ticks, would be no more finely grained than the processes being perceived. So too with spatial perception: Can eyes composed of the smallest units in existence perceive those units? Could *any* informational process sense its ultimate constituents? The point is that the basic units of time and space in Fredkin's reality don't just happen to be imperceptibly small. As long as the creatures doing the perceiving are in that reality, the units *have* to be imperceptibly small.

Though some may find this discreteness hard to comprehend, Fredkin finds a grainy reality more sensible than a smooth one. If reality is truly continuous, as most physicists now believe it is, then there must be quantities that cannot be expressed with a finite number of digits; the number representing the strength of an electromagnetic field, for example, could begin 5.23429847 and go on forever without falling into a pattern of repetition. That seems strange to Fredkin: wouldn't you eventually get to a point, around the hundredth, or thousandth, or millionth decimal place, where you had hit the strength of the field right on the nose? Indeed, wouldn't you expect that *every* physical quantity has an exactness about it? Well, you might and might not. But Fredkin does expect exactness, and in his universe he gets it.

Fredkin has an interesting way of expressing his insistence that all physical quantities be "rational." (A rational number is a number that can be expressed as a fraction—as a *ratio* of one integer to another. Expressed as a decimal, a rational number will either end, as 5/2 does in the form of 2.5, or repeat itself endlessly, as 1/7 does in the form of 0.142857142857142 . . .) He says he finds it hard to believe that a finite volume of space could *contain* an infinite amount of information. It is almost as if he viewed each parcel of space as having the digits describing it actually crammed into it. This seems an odd perspective, one that confuses the thing itself with the information it represents. But such an inversion between the realm of things and the

realm of representation is common among those who work at the interface of computer science and physics. Contemplating the essence of information seems to affect the way you think.

The prospect of a discrete reality, however alien to the average person, is easier to fathom than the problem of the infinite regress, which is also raised by Fredkin's theory. The problem begins with the fact that information typically has a physical basis. Writing consists of ink; speech is composed of sound waves; even the computer's ephemeral bits and bytes are grounded in configurations of electrons. If the electrons are in turn made of information, then what is the information made of?

Asking questions like this ten or twelve times is not a good way to earn Fredkin's respect. A look of exasperation passes fleetingly over his face. "What I've tried to explain is that—and I hate to do this, because physicists are always doing this in an obnoxious way—is that the question implies you're missing a very important concept." He gives it one more try, two more tries, three, and eventually some of the fog between me and his view of the universe disappears. I begin to understand that this is a theory not just of physics but of metaphysics. When you disentangle these theories—compare the physics with other theories of physics, and the metaphysics with other ideas about metaphysics—both sound less far-fetched than when jumbled together as one. And, as a bonus, Fredkin's metaphysics leads to a kind of high-tech theology—to speculation about supreme beings and the purpose of life.



III. The Perfect Thing

EDWARD FREDKIN WAS BORN IN 1934, THE LAST OF three children in a previously prosperous family. His father, Manuel, had come to Southern California from Russia shortly after the Revolution and founded a chain of radio stores that did not survive the Great Depression. The family learned economy, and Fredkin has not forgotten it. He can reach into his pocket, pull out a tissue that should have been retired weeks ago, and, with cleaning solution, make an entire airplane windshield clear. He can take even a well-written computer program, sift through it for superfluous instructions, and edit it accordingly, reducing both its size and its running time.

Manuel was by all accounts a competitive man, and he focused his competitive energies on the two boys: Edward and his older brother, Norman. Manuel routinely challenged Ed's mastery of fact, inciting sustained arguments

over, say, the distance between the moon and the earth. Norman's theory is that his father, though bright, was intellectually insecure; he seemed somehow threatened by the knowledge the boys brought home from school. Manuel's mistrust of books, experts, and all other sources of received wisdom was absorbed by Ed.

So was his competitiveness. Fredkin always considered himself the smartest kid in his class. He used to place bets with other students on exam scores. This habit did not endear him to his peers, and he seems in general to have lacked the prerequisites of popularity. His sense of humor was unusual. His interests were not widely shared. His physique was not a force to be reckoned with. He recalls, "When I was young—you know, sixth, seventh grade—two kids would be choosing sides for a game of something. It could be touch football. They'd choose everybody but me, and then there'd be a fight as to whether one side would have to take me. One side would say, 'We have eight and you have seven,' and they'd say, 'That's okay.' They'd be willing to play with seven." Though exhaustive in documenting his social alienation, Fredkin concedes that he was not the only unpopular student in school. "There was a socially active subgroup, probably not a majority, maybe forty percent, who were very socially active. They went out on dates. They went to parties. They did this and they did that. The others were left out. And I was in this big left-out group. But I was in the pole position. I was *really* left out."

Of the hours Fredkin spent alone, a good many were devoted to courting disaster in the name of science. By wiring together scores of large, 45-volt batteries, he collected enough electricity to conjure up vivid, erratic arcs. By scraping the heads off matches and buying sulfur, saltpeter, and charcoal, he acquired a good working knowledge of pyrotechnics. He built small, minimally destructive but visually impressive bombs, and fashioned rockets out of cardboard tubing and aluminum foil. But more than bombs and rockets, it was mechanisms that captured Fredkin's attention. From an early age he was viscerally attracted to Big Ben alarm clocks, which he methodically took apart and put back together. He also picked up his father's facility with radios and household appliances. But whereas Manuel seemed to fix things without understanding the underlying science, his son was curious about first principles.

So while other kids were playing baseball or chasing girls, Ed Fredkin was taking things apart and putting them back together. Children were aloof, even cruel, but a broken clock always responded gratefully to a healing hand. "I always got along well with machines," he remembers.

After graduation from high school, in 1952, Fredkin headed for the California Institute of Technology with hopes of finding a more appreciative social environment. But students at Caltech turned out to bear a disturbing resemblance to people he had observed elsewhere. "They were smart like me," he recalls, "but they had the full spectrum and distribution of social development." Once

again Fredkin found his weekends unencumbered by parties. And once again he didn't spend his free time studying. Indeed, one of the few lessons he learned is that college is different from high school: in college if you don't study, you flunk out. This he did a few months into his sophomore year. Then, following in his brother's footsteps, he joined the Air Force and learned to fly fighter planes.

IT WAS THE AIR FORCE THAT FINALLY BROUGHT Fredkin face to face with a computer. He was working for the Air Proving Ground Command, whose function was to ensure that everything from combat boots to bombers was of top quality, when the unit was given the job of testing a computerized air-defense system known as SAGE (for "semi-automatic ground environment"). To test SAGE the Air Force needed men who knew something about computers, and so in 1956 a group from the Air Proving Ground Command, including Fredkin, was sent to MIT's Lincoln Laboratory and enrolled in computer-science courses. "Everything made instant sense to me," Fredkin remembers. "I just soaked it up like a sponge."

SAGE, when ready for testing, turned out to be even more complex than anticipated—too complex to be tested by anyone but genuine experts—and the job had to be contracted out. This development, combined with bureaucratic disorder, meant that Fredkin was now a man without a function, a sort of visiting scholar at Lincoln Laboratory. "For a period of time, probably over a year, no one ever came to tell me to do anything. Well, meanwhile, down the hall they installed the latest, most modern computer in the world—IBM's biggest, most powerful computer. So I just went down and started to program it." The computer was an XD-1. It was slower and less capacious than an Apple Macintosh and was roughly the size of a large house.

When Fredkin talks about his year alone with this dinosaur, you half expect to hear violins start playing in the background. "My whole way of life was just waiting for the computer to come along," he says. "The computer was in essence just the perfect thing." It was in some respects preferable to every other conglomeration of matter he had encountered—more sophisticated and flexible than other inorganic machines, and more logical than organic ones. "See, when I write a program, if I write it correctly, it will work. If I'm dealing with a person, and I tell him something, and I tell him correctly, it may or may not work."

The XD-1, in short, was an intelligence with which Fredkin could empathize. It was the ultimate embodiment of mechanical predictability, the refuge to which as a child he had retreated from the incomprehensibly hostile world of humanity. If the universe is indeed a computer, then it could be a friendly place after all.

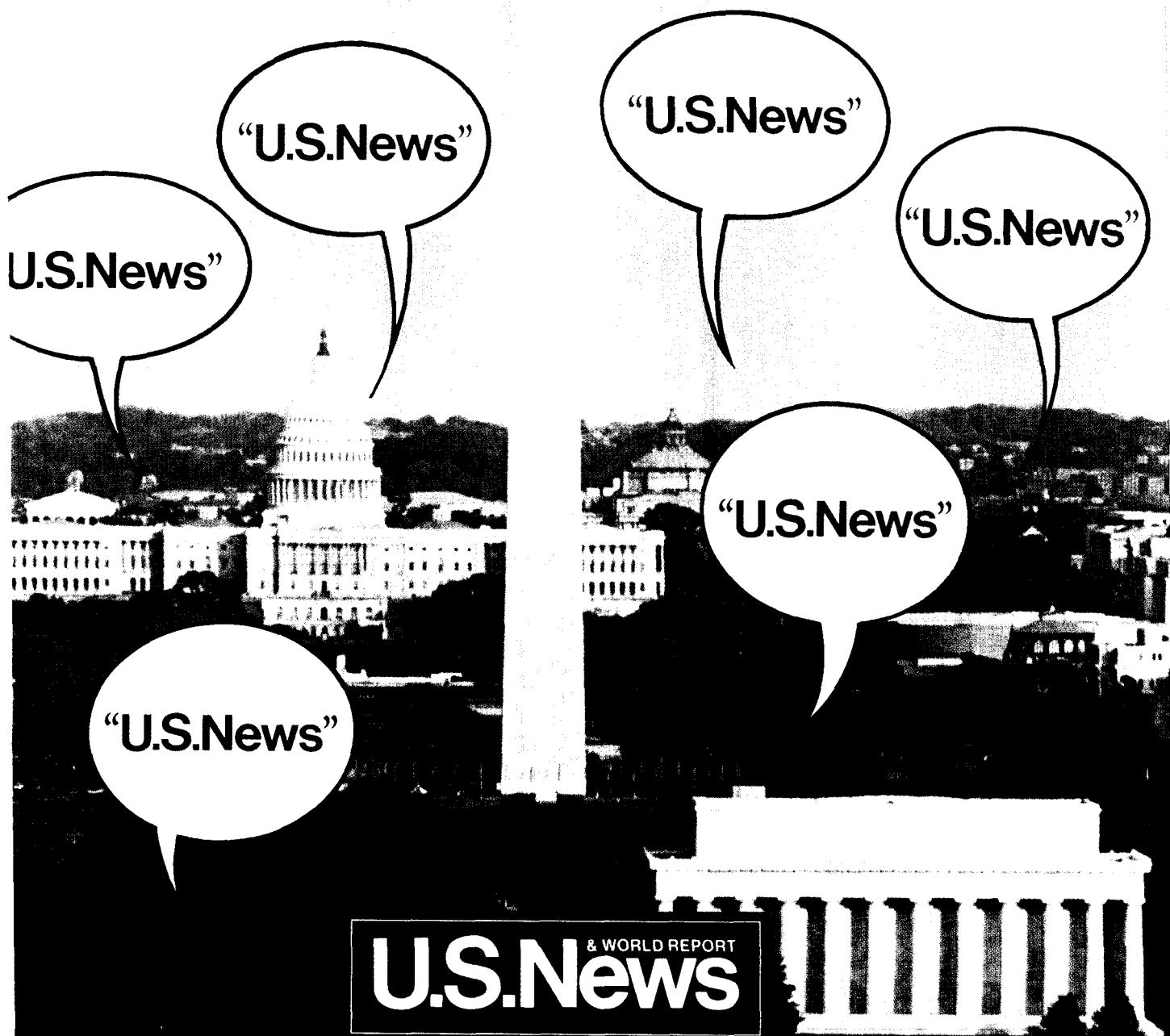
During the several years after his arrival at Lincoln Lab, as Fredkin was joining the first generation of hackers, he was also immersing himself in physics—finally learning,

through self-instruction, the lessons he had missed by dropping out of Caltech. It is this two-track education, Fredkin says, that led him to the theory of digital physics. For a time "there was no one in the world with the same interest in physics who had the intimate experience with computers that I did. I honestly think that there was a period of many years when I was in a unique position."

The uniqueness lay not only in the fusion of physics and computer science but also in the peculiar composition of Fredkin's physics curriculum. Many physicists acquire as children the sort of kinship with mechanism that he still feels, but in most cases it is later diluted by formal education; quantum mechanics, the prevailing paradigm in contemporary physics, seems to imply that at its core, reality has truly random elements and is thus inherently unpredictable. But Fredkin escaped the usual indoctrination. To this day he maintains, as did Albert Einstein, that the common interpretation of quantum mechanics is mistaken—that any seeming indeterminacy in the subatomic world reflects only our ignorance of the determining principles, not their absence. This is a critical belief, for if he is wrong and the universe is *not* ultimately deterministic, then it cannot be governed by a process as exacting as computation.

After leaving the Air Force, Fredkin went to work for Bolt Beranek and Newman, a consulting firm in the Boston area, now known for its work in artificial intelligence and computer networking. His supervisor at BBN, J.C.R. Licklider, says of his first encounter with Fredkin, "It was obvious to me he was very unusual and probably a genius, and the more I came to know him, the more I came to think that that was not too elevated a description." Fredkin "worked almost continuously," Licklider recalls. "It was hard to get him to go to sleep sometimes." A pattern emerged. Licklider would give Fredkin a problem to work on—say, figuring out how to get a computer to search a text in its memory for an only partially specified sequence of letters. Fredkin would retreat to his office and return twenty or thirty hours later with the solution—or, rather, *a* solution; he often came back with the answer to a question different from the one that Licklider had asked. Fredkin's focus was intense but undisciplined, and it tended to stray from a problem as soon as he was confident that he understood the solution in principle.

This intellectual wanderlust is one of Fredkin's most enduring and exasperating traits. Just about everyone who knows him has a way of describing it: "He doesn't really work. He sort of fiddles." "Very often he has these great ideas and then does not have the discipline to cultivate the ideas." "There is a gap between the quality of the original ideas and what follows. There's an imbalance there." Fredkin is aware of his reputation. In self-parody he once brought a cartoon to a friend's attention: A beaver and another forest animal are contemplating an immense man-made dam. The beaver is saying something like, "No, I didn't actually build it. But it's based on an idea of mine."



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U.S. News and World Report, Inc. 1987

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Among the ideas that congealed in Fredkin's mind during his stay at BBN is the one that gave him his current reputation as (depending on whom you talk to) a thinker of great depth and rare insight, a source of interesting but reckless speculation, or a crackpot.



IV. Tick by Tick, Dot by Dot

THE IDEA THAT THE UNIVERSE IS A COMPUTER WAS inspired partly by the idea of the universal computer. *Universal computer*, a term that can accurately be applied to everything from an IBM PC to a Cray supercomputer, has a technical, rigorous definition, but here its upshot will do: a universal computer can simulate any process that can be precisely described and perform any calculation that is performable.

This broad power is ultimately grounded in something very simple: the algorithm. An algorithm is a fixed procedure for converting input into output, for taking one body of information and turning it into another. For example, a computer program that takes any number it is given, squares it, and subtracts three is an algorithm. This isn't a very powerful algorithm; by taking a 3 and turning it into a 6, it hasn't created much new information. But algorithms become more powerful with recursion. A *recursive* algorithm is an algorithm whose output is fed back into it as input. Thus the algorithm that turned 3 into 6, if operating recursively, would continue, turning 6 into 33, then 33 into 1,086, then 1,086 into 1,179,393, and so on.

The power of recursive algorithms is especially apparent in the simulation of physical processes. While Fredkin was at BBN, he would use the company's Digital Equipment Corporation PDP-1 computer to simulate, say, two particles, one that was positively charged and one that was negatively charged, orbiting each other in accordance with the laws of electromagnetism. It was a pretty sight: two phosphor dots dancing, each etching a green trail that faded into yellow and then into darkness. But for Fredkin the attraction lay less in this elegant image than in its underlying logic. The program he had written took the particles' velocities and positions at one point in time, computed those variables for the next point in time, and then fed the new variables back into the algorithm to get newer variables—and so on and so on, thousands of times a second. The several steps in this algorithm, Fredkin recalls, were "very simple and very beautiful." It was in these orbiting phosphor dots that Fredkin first saw the appeal of his kind of universe—a universe that proceeds tick by tick and dot by

dot, a universe in which complexity boils down to rules of elementary simplicity.

Fredkin's discovery of cellular automata a few years later permitted him further to indulge his taste for economy of information and strengthened his bond with the recursive algorithm. The patterns of automata are often all but impossible to describe with calculus yet easy to express algorithmically. Nothing is so striking about a good cellular automaton as the contrast between the simplicity of the underlying algorithm and the richness of its result. We have all felt the attraction of such contrasts. It accompanies the comprehension of any process, conceptual or physical, by which simplicity accommodates complexity. Simple solutions to complex problems, for example, make us feel good. The social engineer who designs uncomplicated legislation that will cure numerous social ills, the architect who eliminates several nagging design flaws by moving a single closet, the doctor who traces gastro-intestinal, cardiovascular, and respiratory ailments to a single, correctable cause—all feel the same kind of visceral, aesthetic satisfaction that must have filled the first caveman who literally killed two birds with one stone.

For scientists, the moment of discovery does not simply reinforce the search for knowledge; it inspires further research. Indeed, it *directs* research. The unifying principle, upon its apprehension, can elicit such devotion that thereafter the scientist looks everywhere for manifestations of it. It was the scientist in Fredkin who, upon seeing how a simple programming rule could yield immense complexity, got excited about looking at physics in a new way and stayed excited. He spent much of the next three decades fleshing out his intuition.

FREDKIN'S RESIGNATION FROM BOLT BERANEK AND Newman did not surprise Licklider. "I could tell that Ed was disappointed in the scope of projects undertaken at BBN. He would see them on a grander scale. I would try to argue—hey, let's cut our teeth on this and then move on to bigger things." Fredkin wasn't biting. "He came in one day and said, 'Gosh, Lick, I really love working here, but I'm going to have to leave. I've been thinking about my plans for the future, and I want to make'—I don't remember how many millions of dollars, but it shook me—'and I want to do it in about four years.' And he did amass however many millions he said he would amass in the time he predicted, which impressed me considerably."

In 1962 Fredkin founded Information International Incorporated—an impressive name for a company with no assets and no clients, whose sole employee had never graduated from college. Triple-I, as the company came to be called, was placed on the road to riches by an odd job that Fredkin performed for the Woods Hole Oceanographic Institute. One of Woods Hole's experiments had run into a complication: underwater instruments had faithfully recorded the changing direction and strength of deep

ocean currents, but the information, encoded in tiny dots of light on sixteen-millimeter film, was inaccessible to the computers that were supposed to analyze it. Fredkin rented a sixteen-millimeter movie projector and with a surprisingly simple modification turned it into a machine for translating those dots into terms the computer could accept.

This contraption pleased the people at Woods Hole and led to a contract with Lincoln Laboratory. Lincoln was still doing work for the Air Force, and the Air Force wanted its computers to analyze radar information that, like the Woods Hole data, consisted of patterns of light on film. A makeshift information-conversion machine earned Triple-I \$10,000, and within a year the Air Force hired Fredkin to build equipment devoted to the task. The job paid \$350,000—the equivalent today of around \$1 million. RCA and other companies, it turned out, also needed to turn visual patterns into digital data, and “programmable film readers” that sold for \$500,000 apiece became Triple-I’s stock-in-trade. In 1968 Triple-I went public and Fredkin was suddenly a millionaire. Gradually he cashed in his chips. First he bought a ranch in Colorado. Then one day he was thumbing through the classifieds and saw that an island in the Caribbean was for sale. He bought it.

In the early 1960s, at the suggestion of the Defense Department’s Advanced Research Projects Agency, MIT set up what would become its Laboratory for Computer Science. It was then called Project MAC, an acronym that stood for both “machine-aided cognition” and “multi-access computer.” Fredkin had connections with the project from the beginning. Licklider, who had left BBN for the Pentagon shortly after Fredkin’s departure, was influential in earmarking federal money for MAC. Marvin Minsky—who would later serve on Triple-I’s board, and by the end of 1967 owned some of its stock—was centrally involved in MAC’s inception. Fredkin served on Project MAC’s steering committee, and in 1966 he began discussing with Minsky the possibility of becoming a visiting professor at MIT. The idea of bringing a college dropout onto the faculty, Minsky recalls, was not as outlandish as it now sounds; computer science had become an academic discipline so suddenly that many of its leading lights possessed meager formal credentials. In 1968, after Licklider had come to MIT and become the director of Project MAC, he and Minsky convinced Louis Smullin, the head of the electrical-engineering department, that Fredkin was worth the gamble. “We were a growing department and we wanted exciting people,” Smullin says. “And Ed was exciting.”

Fredkin had taught for barely a year before he became a full professor, and not much later, in 1971, he was appointed the head of Project MAC—a position that was also short-lived, for in the fall of 1974 he began a sabbatical at the California Institute of Technology as a Fairchild Distinguished Scholar. He went to Caltech under the sponsorship of Richard Feynman. The deal, Fredkin recalls, was that he would teach Feynman more about computer science, and Feynman would teach him more about physics.

While there, Fredkin developed an idea that has slowly come to be seen as a profound contribution to both disciplines. The idea is also—in Fredkin’s mind, at least—corroborating evidence for his theory of digital physics. To put its upshot in brief and therefore obscure terms, Fredkin found that computation is not inherently irreversible and thus it is possible, in principle, to build a computer that doesn’t use up energy and doesn’t give off heat.

All computers on the market *are* irreversible. That is, their history of information processing cannot be inferred from their present informational state; you cannot look at the data they contain and figure out how they arrived at it. By the time the average computer tells you that 2 plus 2 equals 4, it has forgotten the question; for all it knows, you asked what 1 plus 3 is. The reason for this ignorance is that computers discharge information once it is no longer needed, so that they won’t get clogged up.

In 1961 Rolf Landauer, of IBM’s Thomas J. Watson Research Center, established that this destruction of information is the only part of the computational process that unavoidably involves the dissipation of energy. It takes effort, in other words, for a computer to forget things but not necessarily for it to perform other functions. Thus the question of whether you can, in principle, build a universal computer that doesn’t dissipate energy in the form of heat is synonymous with the question of whether you can design a logically reversible universal computer, one whose computational history can always be unearthed. Landauer, along with just about everyone else, thought such a computer impossible; all past computer architectures had implied the regular discarding of information, and it was widely believed that this irreversibility was intrinsic to computation. But while at Caltech, Fredkin did one of his favorite things—he showed that everyone had been wrong all along.

Of the two kinds of reversible computers invented by Fredkin, the better known is called the billiard-ball computer. If it were ever actually built, it would consist of billiard balls ricocheting around in a labyrinth of “mirrors,” bouncing off the mirrors at 45-degree angles, periodically banging into other moving balls at 90-degree angles, and occasionally exiting through doorways that occasionally would permit new balls to enter. To extract data from the machine, you would superimpose a grid over it, and the presence or absence of a ball in a given square at a given point in time would constitute information. Such a machine, Fredkin showed, would qualify as a universal computer; it could do anything that normal computers do. But unlike other computers, it would be perfectly reversible; to recover its history, all you would have to do is stop it and run it backward. Charles H. Bennett, of IBM’s Thomas J. Watson Research Center, independently arrived at a different proof that reversible computation is possible, though he considers the billiard-ball computer to be in some respects a more elegant solution to the problem than his own.

The billiard-ball computer will never be built, because

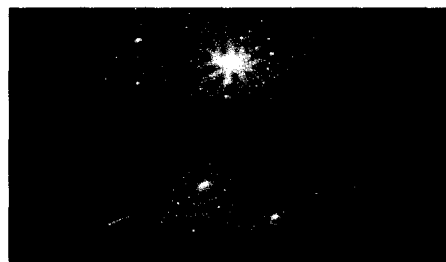
it is a platonic device, existing only in a world of ideals. The balls are perfectly round and hard, and the table perfectly smooth and hard. There is no friction between the two, and no energy is lost when balls collide. Still, although these ideals are unreachable, they could be approached eternally through technological refinement, and the heat produced by friction and collision could thus be reduced without limit. Since no additional heat would be created by information loss, there would be no necessary minimum on the total heat emitted by the computer. "The cleverer you are, the less heat it will generate," Fredkin says.

The connection Fredkin sees between the billiard-ball computer and digital physics exemplifies the odd assortment of evidence he has gathered in support of his theory. Molecules and atoms and their constituents, he notes, move around in theoretically reversible fashion, like billiard balls (although it is not humanly possible, of course, actually to take stock of the physical state of the universe, or even one small corner of it, and reconstruct history by tracing the motion of microscopic particles backward). Well, he asks, given the theoretical reversibility of physical reality, doesn't the theoretical feasibility of a reversible computer lend credence to the claim that computation is reality's basis?

No and yes. Strictly speaking, Fredkin's theory doesn't demand reversible computation. It is conceivable that an irreversible process at the very core of reality could give rise to the reversible behavior of molecules, atoms, electrons, and the rest. After all, irreversible computers (that is, all computers on the market) can simulate reversible billiard balls. But they do so in a convoluted way, Fredkin says, and the connection between an irreversible substratum and a reversible stratum would, similarly, be tortuous—or, as he puts it, "aesthetically obnoxious." Fredkin prefers to think that the cellular automaton underlying reversible reality does its work gracefully.

Consider, for example, a variant of the billiard-ball computer invented by Norman Margolus, the Canadian in MIT's information-mechanics group. Margolus showed how a two-state cellular automaton that was itself reversible could simulate the billiard-ball computer using only a simple rule involving a small neighborhood. This cellular automaton in action looks like a jazzed-up version of the original video game, Pong. It is an overhead view of endlessly energetic balls ricocheting off clusters of mirrors and each other. It is proof that a very simple binary cellular automaton can give rise to the seemingly more complex behavior of microscopic particles bouncing off each other. And, as a kind of bonus, these particular particles themselves amount to a computer. Though Margolus discovered this powerful cellular-automaton rule, it was Fredkin who had first concluded that it must exist and persuaded Margolus to look for it. "He has an intuitive idea of how things should be," Margolus says. "And often, if he can't come up with a rational argument to convince you that it should be so, he'll sort of transfer his intuition to you."

That, really, is what Fredkin is trying to do when he argues that the universe is a computer. He cannot give you a single line of reasoning that leads inexorably, or even very plausibly, to this conclusion. He can tell you about the reversible computer, about Margolus's cellular automaton, about the many physical quantities, like light, that were once thought to be continuous but are now considered discrete, and so on. The evidence consists of many little things—so many, and so little, that in the end he is forced to convey his truth by simile. "I find the supporting evidence for my beliefs in ten thousand different places," he says. "And to me it's just totally overwhelming. It's like there's an animal I want to find. I've found his footprints. I've found his droppings. I've found the half-chewed food. I find pieces of his fur, and so on. In every case it fits one kind of animal, and it's not like any animal anyone's ever seen. People say, Where is this animal? I say, Well, he was here, he's about this big, this that and the other. And I know a thousand things about him. I don't have him in hand, but I know he's there." The story changes upon retelling. One day it's Bigfoot that Fredkin's trailing. Another day it's a duck: feathers are everywhere, and the tracks are webbed. Whatever the animal, the moral of the story remains the same: "What I see is so compelling that it can't be a creature of my imagination."



V. Deus ex Machina

THERE WAS SOMETHING BOTHERSOME ABOUT ISAAC Newton's theory of gravitation. The idea that the sun exerts a pull on the earth, and vice versa, sounded vaguely supernatural and, in any event, was hard to explain. How, after all, could such "action at a distance" be realized? Did the earth look at the sun, estimate the distance, and consult the law of gravitation to determine where it should move and how fast? Newton sidestepped such questions. He fudged with the Latin phrase *si esset*: two bodies, he wrote, behave *as if* impelled by a force inversely proportional to the square of their distance. Ever since Newton, physics has followed his example. Its "forces" and "fields" are, strictly speaking, metaphorical, and its laws purely descriptive. Physicists make no attempt to explain why things obey the law of electromagnetism or of gravitation. The law is the law, and that's all there is to it.

Fredkin refuses to accept authority so blindly. He posits not only laws but also a law-enforcement agency: a computer. Somewhere out there, he believes, is a machine-

like thing that actually keeps our individual bits of space abiding by the rule of the universal cellular automaton. With this belief Fredkin crosses the line between physics and metaphysics, between scientific hypothesis and cosmic speculation. If Fredkin had Newton's knack for public relations, if he stopped at saying that the universe operates *as if* it were a computer, he could improve his stature among physicists while preserving the essence of his theory—the idea that the dynamics of physical reality will ultimately be better captured by a single recursive algorithm than by the mathematics of conventional physics, and that the continuity of time and space implicit in traditional mathematics is illusory.

Actually, some estimable physicists have lately been saying things not wholly unlike this stripped-down version of the theory. T. D. Lee, a Nobel laureate at Columbia University, has written at length about the possibility that time is discrete. And in 1984 *Scientific American*, not exactly a soapbox for cranks, published an article in which Stephen Wolfram, then of Princeton's Institute for Advanced Study, wrote, "Scientific laws are now being viewed as algorithms. . . . Physical systems are viewed as computational systems, processing information much the way computers do." He concluded, "A new paradigm has been born."

The line between responsible scientific speculation and off-the-wall metaphysical pronouncement was nicely illustrated by an article in which Tommaso Toffoli, the Italian in MIT's information-mechanics group, stayed barely on the responsible side of it. Published in the journal *Physica D*, the article was called "Cellular automata as an alternative to (rather than an approximation of) differential equations in modeling physics." Toffoli's thesis captured the core of Fredkin's theory yet had a perfectly reasonable ring to it. He simply suggested that the historical reliance of physicists on calculus may have been due not just to its merits but also to the fact that before the computer, alternative languages of description were not practical.

Why does Fredkin refuse to do the expedient thing—leave out the part about the universe actually *being* a computer? One reason is that he considers reprehensible the failure of Newton, and of all physicists since, to back up their descriptions of nature with explanations. He is amazed to find "perfectly rational scientists" believing in "a form of mysticism: that things just happen because they happen." The best physics, Fredkin seems to believe, is metaphysics.

The trouble with metaphysics is its endless depth. For every question that is answered, at least one other is raised, and it is not always clear that, on balance, any progress has been made. For example, where is this computer that Fredkin keeps talking about? Is it in this universe, residing along some fifth or sixth dimension that renders it invisible? Is it in some meta-universe? The answer is the latter, apparently, and to understand why, we need to return to the problem of the infinite regress, a problem that Rolf Landauer, among others, has cited with respect to Fredkin's theory. Landauer illustrates the problem by tell-

ing the old turtle story. A professor has just finished lecturing at some august university about the origin and structure of the universe, and an old woman in tennis shoes walks up to the lectern. "Excuse me, sir, but you've got it all wrong," she says. "The truth is that the universe is sitting on the back of a huge turtle." The professor decides to humor her. "Oh, really?" he asks. "Well, tell me, what is the turtle standing on?" The lady has a ready reply: "Oh, it's standing on another turtle." The professor asks, "And what is *that* turtle standing on?" Without hesitation, she says, "Another turtle." The professor, still game, repeats his question. A look of impatience comes across the woman's face. She holds up her hand, stopping him in mid-sentence. "Save your breath, sonny," she says. "It's turtles all the way down."

The infinite-regress problem afflicts Fredkin's theory in two ways, one of which we have already encountered: if matter is made of information, what is the information made of? And even if one concedes that it is no more ludicrous for information to be the most fundamental stuff than for matter or energy to be the most fundamental stuff, what about the computer itself? What is *it* made of? What energizes it? Who, or what, runs it, or set it in motion to begin with?

WHEN FREDKIN IS DISCUSSING THE PROBLEM OF THE infinite regress, his logic seems variously cryptic, evasive, and appealing. At one point he says, "For everything in the world where you wonder, 'What is it made out of?' the only thing I know of where the question doesn't have to be answered with anything else is for information." This puzzles me. Thousands of words later I am still puzzled, and I press for clarification. He talks some more. What he means, as near as I can tell, is what follows.

First of all, it doesn't matter what the information is made of, or what kind of computer produces it. The computer could be of the conventional electronic sort, or it could be a hydraulic machine made of gargantuan sewage pipes and manhole covers, or it could be something we can't even imagine. What's the difference? Who cares what the information consists of? So long as the cellular automaton's rule is the same in each case, the patterns of information will be the same, and so will we, because the structure of our world depends on *pattern*, not on the pattern's substrate; a carbon atom, according to Fredkin, is a certain *configuration* of bits, not a certain *kind* of bits.

Besides, we can never know what the information is made of or what kind of machine is processing it. This point is reminiscent of childhood conversations that Fredkin remembers having with his sister, Joan, about the possibility that they were part of a dream God was having. "Say God is in a room and on his table he has some cookies and tea," Fredkin says. "And he's dreaming this whole universe up. Well, we can't reach out and get his cookies. They're not in our universe. See, our universe has bounds. There are some things in it and some things not."

The computer is not; hardware is beyond the grasp of its software. Imagine a vast computer program that contained bodies of information as complex as people, motivated by bodies of information as complex as ideas. These “people” would have no way of figuring out what kind of computer they owed their existence to, because everything they said, and everything they did—including formulate metaphysical hypotheses—would depend entirely on the programming rules and the original input. As long as these didn’t change, the same metaphysical conclusions would be reached in an old XD-1 as in a Kaypro 2.

This idea—that sentient beings could be constitutionally numb to the texture of reality—has fascinated a number of people, including, lately, computer scientists. One source of the fascination is the fact that any universal computer can simulate another universal computer, and the simulated computer can, because it is universal, do the same thing. So it is possible to conceive of a theoretically endless series of computers contained, like Russian dolls, in larger versions of themselves and yet oblivious of those containers. To anyone who has lived intimately with, and thought deeply about, computers, says Charles Bennett, of IBM’s Watson Lab, this notion is very attractive. “And if you’re too attracted to it, you’re likely to part company with the physicists.” Physicists, Bennett says, find heretical the notion that *anything* physical is impervious to experiment, removed from the reach of science.

GETHSEMANE

On a hill backlit by twilight,
the disciples gather like crows
for the night.

This is their down time, time to browse
among the olive branches, Christ with them,
their apostolic flight slowed at last to a head-nodding drowse,

to a flutter of tattered cloak, the unraveling hem
dragging in the dirt like a hurt wing.
They flock momentarily around him,

then settle down, safe in the soft swing
of wind that rises and then falls back
with the deepening evening

into the distance, and sleep, while Christ’s black
feathers burn in his father’s fist,
plucked by God before by Judas kissed.

—Kelly Cherry

Fredkin’s belief in the limits of scientific knowledge may sound like evidence of humility, but in the end it permits great ambition; it helps him go after some of the grandest philosophical questions around. For example, there is a paradox that crops up whenever people think about how the universe came to be. On the one hand, it must have had a beginning. After all, things usually do. Besides, the cosmological evidence suggests a beginning: the big bang. Yet science insists that it is impossible for something to come from nothing; the laws of physics forbid the amount of energy and mass in the universe to change. So how could there have been a time when there was no universe, and thus no mass or energy?

Fredkin escapes from this paradox without breaking a sweat. Granted, he says, the laws of *our* universe don’t permit something to come from nothing. But he can imagine laws that would permit such a thing; in fact, he can imagine algorithmic laws that would permit such a thing. The conservation of mass and energy is a consequence of our cellular automaton’s rules, not a consequence of all possible rules. Perhaps a different cellular automaton governed the creation of our cellular automaton—just as the rules for loading software are different from the rules running the program once it has been loaded.

What’s funny is how hard it is to doubt Fredkin when with such assurance he makes definitive statements about the creation of the universe—or when, for that matter, he looks you in the eye and tells you the universe is a computer. Partly this is because, given the magnitude and intrinsic intractability of the questions he is addressing, his answers aren’t all that bad. As ideas about the foundations of physics go, his are not completely out of the ball park; as metaphysical and cosmogonic speculation goes, his isn’t beyond the pale.

But there’s more to it than that. Fredkin is, in his own odd way, a rhetorician of great skill. He talks softly, even coolly, but with a low-key power, a quiet and relentless confidence, a kind of high-tech fervor. And there is something disarming about his self-awareness. He’s not one of these people who say crazy things without having so much as a clue that you’re sitting there thinking what crazy things they are. He is acutely conscious of his reputation; he knows that some scientists are reluctant to invite him to conferences for fear that he’ll say embarrassing things. But he is not fazed by their doubts. “You know, I’m a reasonably smart person. I’m not the smartest person in the world, but I’m pretty smart—and I know that what I’m involved in makes perfect sense. A lot of people build up what might be called self-delusional systems, where they have this whole system that makes perfect sense to them, but no one else ever understands it or buys it. I don’t think that’s a major factor here, though others might disagree.” It’s hard to disagree, when he so forthrightly offers you the chance.

Still, as he gets further from physics, and more deeply into philosophy, he begins to try one’s trust. For example, having tackled the question of what sort of process could

generate a universe in which spontaneous generation is impossible, he aims immediately for bigger game: *Why* was the universe created? Why is there something here instead of nothing?

WHEN THIS SUBJECT COMES UP, WE ARE SITTING IN the Fredkins' villa. The living area has pale rock walls, shiny-clean floors made of large white ceramic tiles, and built-in bookcases made of blond wood. There is lots of air—the ceiling slopes up in the middle to at least twenty feet—and the air keeps moving; some walls consist almost entirely of wooden shutters that, when open, let the sea breeze pass as fast as it will. I am glad of this. My skin, after three days on Fredkin's island, is hot, and the air, though heavy, is cool. The sun is going down.

Fredkin, sitting on a white sofa, is talking about an interesting characteristic of some computer programs, including many cellular automata: there is no shortcut to finding out what they will lead to. This, indeed, is a basic difference between the "analytical" approach associated with traditional mathematics, including differential equations, and the "computational" approach associated with algorithms. You can predict a future state of a system susceptible to the analytic approach without figuring out what states it will occupy between now and then, but in the case of many cellular automata, you must go through all the intermediate states to find out what the end will be like: there is no way to know the future except to watch it unfold.

This indeterminacy is very suggestive. It suggests, first of all, why so many "chaotic" phenomena, like smoke rising from a cigarette, are so difficult to predict using conventional mathematics. (In fact, some scientists have taken to modeling chaotic systems with cellular automata.) To Fredkin, it also suggests that even if human behavior is entirely determined, entirely inevitable, it may be unpredictable; there is room for "pseudo free will" in a completely mechanistic universe. But on this particular evening Fredkin is interested mainly in cosmogony, in the implications of this indeterminacy for the big question: Why does this giant computer of a universe exist?

It's simple, Fredkin explains: "The reason is, there is no way to know the answer to some question any faster than what's going on."

Aware that he may have said something enigmatic, Fredkin elaborates. Suppose, he says, that there is an all-powerful God. "And he's thinking of creating this universe. He's going to spend seven days on the job—this is totally allegorical—or six days on the job. Okay, now, if he's as all-powerful as you might imagine, he can say to himself, 'Wait a minute, why waste the time? I can create the whole thing, or I can just think about it for a minute and just realize what's going to happen so that I don't have to bother.' Now, ordinary physics says, Well, yeah, you got an all-powerful God, he can probably do that. What I can

say is—this is very interesting—I can say I don't care how powerful God is; he cannot know the answer to the question any faster than doing it. Now, he can have various ways of doing it, but he has to do every Goddamn single step with every bit or he won't get the right answer. There's no shortcut."

Around sundown on Fredkin's island all kinds of insects start chirping or buzzing or whirring. Meanwhile, the wind chimes hanging just outside the back door are tinkling with methodical randomness. All this music is eerie and vaguely mystical. And so, increasingly, is the conversation. It is one of those moments when the context you've constructed falls apart, and gives way to a new, considerably stranger one. The old context in this case was that Fredkin is an iconoclastic thinker who believes that space and time are discrete, that the laws of the universe are algorithmic, and that the universe works *according to the same principles* as a computer (he uses this very phrasing in his most circumspect moments). The new context is that Fredkin believes that the universe is very literally a computer and that it is being used by someone, or something, to solve a problem. It sounds like a good-news/bad-news joke: the good news is that our lives have purpose; the bad news is that their purpose is to help some remote hacker estimate pi to nine jillion decimal places.

So, I say, you're arguing that the reason we're here is that some being wanted to theorize about reality, and the only way he could test his theories was to create reality? "No, you see, my explanation is much more abstract. I don't imagine there is a being or anything. I'm just using that to talk to you about it. What I'm saying is that there is no way to know what the future is any faster than running this [the universe] to get to that [the future]. Therefore, what I'm assuming is that there is a question and there is an answer, okay? I don't make any assumptions about who has the question, who wants the answer, anything."

But the more we talk, the closer Fredkin comes to the religious undercurrents he's trying to avoid. "Every astrophysical phenomenon that's going on is always assumed to be just accident," he says. "To me, this is a fairly arrogant position, in that intelligence—and computation, which includes intelligence, in my view—is a much more universal thing than people think. It's hard for me to believe that everything out there is just an accident." This sounds awfully like a position that Pope John Paul II or Billy Graham would take, and Fredkin is at pains to clarify his position: "I guess what I'm saying is—I don't have any religious belief. I don't believe that there is a God. I don't believe in Christianity or Judaism or anything like that, okay? I'm not an atheist, I'm not an agnostic, I'm just in a simple state. I don't know what there is or might be. But what I can say is that it seems likely to me that this particular universe we have is a consequence of something I would call intelligent." Does he mean that there's something out there that wanted to get the answer to a question? "Yeah." Something that set up the universe to see what would happen? "In some way, yes."

VI. The Language Barrier

IN 1974, UPON RETURNING TO MIT FROM CALTECH, Fredkin was primed to revolutionize science. Having done the broad conceptual work (concluding that the universe is a computer), he would enlist the aid of others in taking care of the details—translating the differential equations of physics into algorithms, experimenting with cellular-automaton rules and selecting the most elegant, and, eventually, discovering *The Rule*, the single law that governs every bit of space and accounts for everything. “He figured that all he needed was some people who knew physics, and that it would all be easy,” Margolus says.

One early obstacle was Fredkin’s reputation. He says, “I would find a brilliant student; he’d get turned on to this stuff and start to work on it. And then he would come to me and say, ‘I’m going to work on something else.’ And I would say, ‘Why?’ And I had a few very honest ones, and they would say, ‘Well, I’ve been talking to my friends about this and they say I’m totally crazy to work on it. It’ll ruin my career. I’ll be tainted forever.’” Such fears were not entirely unfounded. Fredkin is one of those people who arouse either affection, admiration, and respect, or dislike and suspicion. The latter reaction has come from a number of professors at MIT, particularly those who put a premium on formal credentials, proper academic conduct, and not sounding like a crackpot. Fredkin was never oblivious of the complaints that his work wasn’t “worthy of MIT,” nor of the movements, periodically afoot, to sever, or at least weaken, his ties to the university. Neither were his graduate students.

Fredkin’s critics finally got their way. In the early 1980s, while he was serving briefly as the president of Boston’s CBS-TV affiliate, someone noticed that he wasn’t spending much time around MIT and pointed to a faculty rule limiting outside professional activities. Fredkin was finding MIT “less and less interesting” anyway, so he agreed to be designated an adjunct professor. As he recalls the deal, he was going to do a moderate amount of teaching and be paid an “appropriate” salary. But he found the actual salary insulting, declined payment, and never got around to teaching. Not surprisingly, he was not reappointed adjunct professor when his term expired, in 1986. Meanwhile, he had so nominally discharged his duties as the head of the information-mechanics group that the title was given to Toffoli.

Fredkin doubts that his ideas will achieve widespread acceptance anytime soon. He believes that most physicists are so deeply immersed in their kind of mathematics, and so uncomprehending of computation, as to be incapable of grasping the truth. Imagine, he says, that a twentieth-century time traveler visited Italy in the early seventeenth century and tried to reformulate Galileo’s ideas in terms of calculus. Although it would be a vastly more powerful language of description than the old one, conveying its importance to the average scientist would be nearly impossible.

There are times when Fredkin breaks through the language barrier, but they are few and far between. He can sell one person on one idea, another on another, but nobody seems to get the big picture. It’s like a painting of a horse in a meadow, he says. “Everyone else only looks at it with a microscope, and they say, ‘Aha, over here I see a little brown pigment. And over here I see a little green pigment.’ Okay. Well, I see a horse.”

Fredkin’s research has nevertheless paid off in unanticipated ways. Comparing a computer’s workings and the dynamics of physics turned out to be a good way to figure out how to build a very efficient computer—one that harnesses the laws of physics with great economy. Thus Toffoli and Margolus have designed an inexpensive but powerful cellular-automata machine, the CAM 6. The “machine” is actually a circuit board that when inserted in a personal computer permits it to orchestrate visual complexity at a speed that can be matched only by general-purpose computers costing hundreds of thousands of dollars. Since the circuit board costs only around \$1,500, this engrossing machine may well entice young scientific revolutionaries into joining the quest for *The Rule*. Fredkin speaks of this possibility in almost biblical terms. “The big hope is that there will arise somewhere someone who will have some new, brilliant ideas,” he says. “And I think this machine will have a dramatic effect on the probability of that happening.”

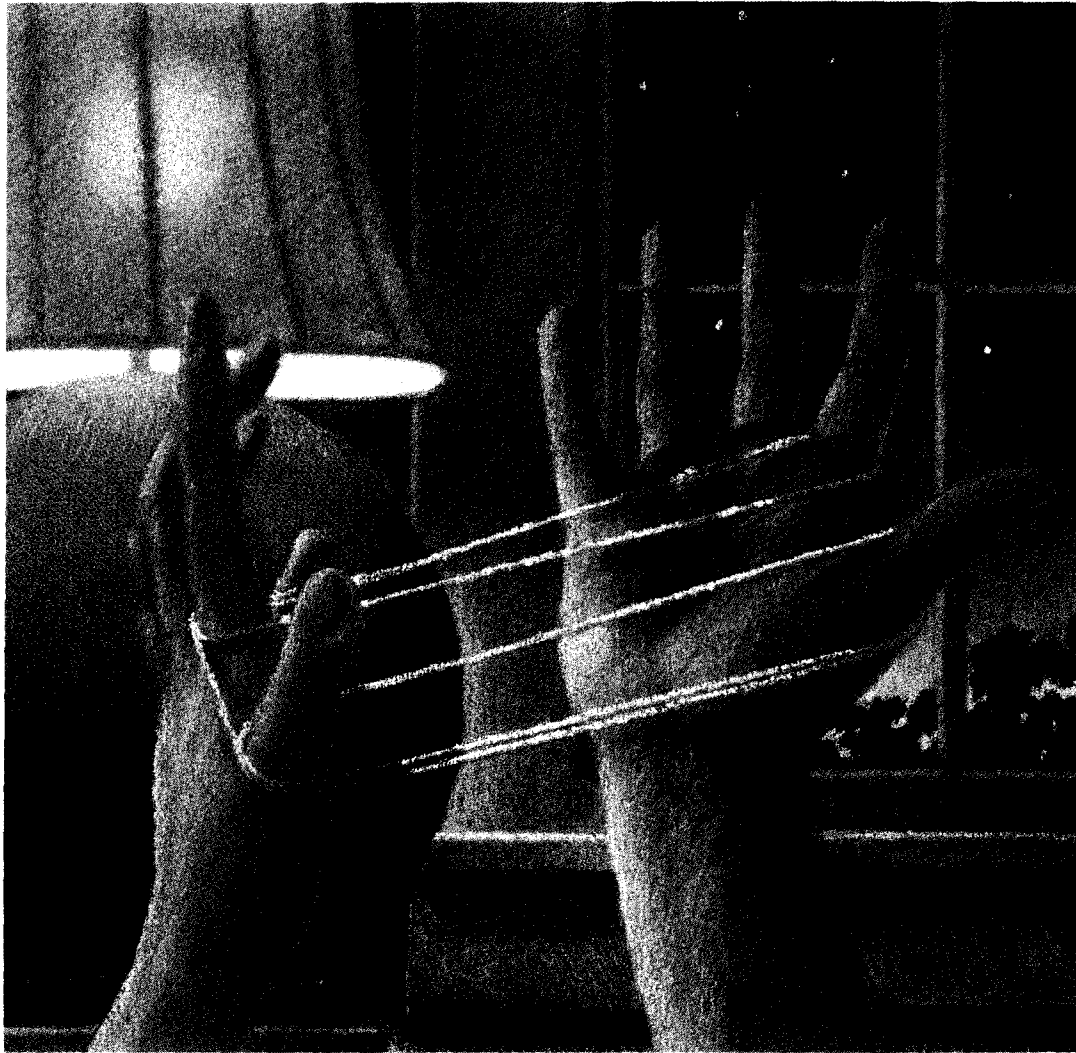
But even if it does happen, it will not ensure Fredkin a place in scientific history. He is not really on record as believing that the universe is a computer. Although some of his tamer insights have been adopted, fleshed out, and published by Toffoli or Margolus, sometimes in collaboration with him, Fredkin himself has published nothing on digital physics. His stated rationale for not publishing has to do with, of all things, lack of ambition. “I’m just not terribly interested,” he says. “A lot of people are fantastically motivated by publishing. It’s part of a whole thing of getting ahead in the world.” Margolus has another explanation: “Writing something down in good form takes a lot of time. And usually by the time he’s done with the first or second draft, he has another wonderful idea that he’s off on.”

These two theories have merit, but so does a third: Fredkin can’t write for academic journals. He doesn’t know how. His erratic, hybrid education has left him with a mixture of terminology that neither computer scientists nor physicists recognize as their native tongue. Further, he is not schooled in the rules of scientific discourse; he seems just barely aware of the line between scientific hypothesis and philosophical speculation. He is not politic enough to confine his argument to its essence: that time and space are discrete, and that the state of every point in space at any point in time is determined by a single algorithm. In short, the very background that has allowed Fredkin to see the universe as a computer seems to prevent him from sharing his vision. If he could talk like other scientists, he might see only the things that they see. □

BEAM

BY GUY BILLOUT





A Short Story



WHAT MEN LOVE FOR

BY DALE RAY PHILLIPS

WHEN I WAS TWELVE, MY FATHER CALLED ON weeknights to convince my mother that he would return safely that weekend and to assure himself that his house was still in order. The phone's ringing always startled my mother from what she was doing—blowing smoke rings through the window screen or, when she was extremely melancholy, cutting her face out of old pictures of herself. The calls sent her swiftly to the bathroom, where she locked the door and gargled. She had returned home that spring after a nervous breakdown, and she believed that each ring meant my father had driven off some mountainside or had abandoned us because she was a manic depressive. Her worst fear was that he was calling from a pay phone somewhere past the Appalachians,

to say he was on his way to sunny and golden California.

"Richard," my father said one night. "You keeping the home motor tuned and purring for your old man?" Our weekend hobby was restoring motorcycles. "How's the chrome tank on that Harley coming along? You got the rust spots off yet?"

"Everything's as shiny as a new dime," I said.

"And your mother. You would tell me if something was wrong again?"

"Old Buck's got everything under control," I said. Buck Rogers was my father's childhood hero, and he trusted me when I called myself that. This was the summer of the moon shot; I suspect almost every father wanted his son to be an astronaut.

"You can count on old Buck." My mother picked up the bedroom extension. My father explained to her that when he came home that weekend, we would grill steaks and make ice cream.

"By God, we might even break out the old Satchmo records and some wine, and dance in the kitchen. Have us a cozy little party with the lights turned low."

My father addressed me, on the kitchen extension, now. "Hey, Richard. They called your old man 'Fleet Foot' back in the days when dancing was dancing." There on the kitchen table my mother had carefully aligned the cut-out faces in one row and the pictures in another. And then my father was rambling again, saying that he was up for a promotion, which would mean less traveling. "After Labor Day, I should be home two days a week, plus weekends. Two or three years of that and who knows?" His dream was to quit traveling through North Carolina, where we lived, and Virginia. He presented my mother with a version of how life would be once he got the right breaks and became the owner of his own hospital-supply company. "I'd be home every night. The business would be shaky at first, but hell, all businesses are. Ours would be a family enterprise that *worked*. We'd all take an interest in it, make decisions together, things like that."

"You can count old Buck in," I said.

"What about now?" my mother asked.

"Labor Day," my father said. "Let me snag that promotion and I'll be home more. Is that too much to ask?"

"I suppose not." My mother hung up her extension. I said the good-byes for us both. I put the faces and the pictures they'd come from into the photograph box, and then I retrieved a sleeping pill from the supply I kept hidden. I went to where my mother lay in bed, gave her one, and turned the fan on low.

"You have to stop doing this," I said.

"It helps when I feel bad." I had a difficult time understanding what had happened to the woman who had once laughed and clapped as I walked around the kitchen on my hands, saying to her, "This is how they walk in China—upside down," the change tumbling from my pockets. She had been glum and anxious since coming back. "Please don't tell," she had said when I first caught her cutting her face from the pictures. She held the photograph to her face, looking at me through an image of herself, eye blinking and peering where her face had been. At the time I was afraid that my father would guess that her nervousness had returned, and that they would take her away again. These secrets from my father held us together.

"Can we do cat's cradle?" she asked. She had folded her robe over a chair beside the bed, and she took the string from its pocket. I sat beside her and played cat's cradle. The twine slipped from her hands to mine and then back, each exchange making a different configuration. As she slipped into sleep, I made Jacob's ladder, weaving a narrow net of string twisted taut between my fingers. We were strings of a fragile ladder, working in collusion with and against each other.

THE COOL PORTION OF EACH MORNING, I SET UP A ladder before the dew had evaporated, when no one was stirring on our street except the milkman and husbands taking out the garbage before leaving for work. My job was to reglaze a third-floor window. I learned the simple but universal law that craftsmen somehow know—that working with your hands is a pleasure, especially work so mindless that everything you need to forget becomes absorbed by the sash to be mended. This law's implication is that in routing out a bad strip of glazing, in sanding the sash carefully, protecting the glass pane from the paper's grains with a fingertip, in the decisions made on each of the window's sixteen panes, something small is set straight that affects the universe. Window glazing requires a dangerous angling of your body if the putty lines are to be drawn straight and true. Everything sits arranged on the sill—hammer, sandpaper, primer, points, and putty. The dissonant parts of yourself hang divided in the graph made by the window sash. To fall inward toward your reflection would be as disastrous as falling backward, to the ground. This tension feels natural, good. The morning smelled of sweat and of the linseed oil rubbed into the wood yesterday to revive its vigor. Vigor is also in the worker. Women sense this, and they are pleased.

"I made you some coffee," my mother said one morning. She stood at the ladder's bottom in her robe and slippers. I came down the ladder for the coffee.

"It's going to be a *good* day, isn't it?" A good day meant she would not need crying or the pictures.

"It's going to be a *great* day," I said.

We shared a cigarette. She allowed me to smoke on certain mornings like these. Often she talked to me about the way she felt.

"The problem, Richard, is that everything makes me so sad. It's like Christmas, with all those presents. Most people look at the gifts and think of all the nice things inside. But ever since I was a small girl, I've worried about tearing the wrappers open and finding something inside I didn't want. The wrappers were so pretty, but I was always afraid they were hiding something awful. Is it like that for you? Are you afraid of finding something inside that you don't want?"

I told her that almost anything but long underwear suited me just fine.

"You're like your father. You're lucky you're easy to please. Any other man would probably have left me, I know. I get mad at him for *not* leaving, Richard. Then I get mad when he isn't here. Isn't it strange, the way you feel sometimes?"

"It'll be a good day," I said. "Don't worry."

My mother went inside, and I stood for a moment admiring my work and the sun held tightly in the window. The ladder sagged as I climbed back up. As I passed my mother's room, I stopped to watch her in her bathroom before the mirror. She was brushing her hair, and I was startled when her hair held static and a few strands reached up to grab at the brush. She stroked, stopped to scrutinize

something in her face, resumed. The awkwardness of being outside and not able to affect her settled in my stomach. She saw me for an instant and waved and went back to her reflection. The wave was one of those waves you see from someone on a porch when he suddenly notices a passing car and gives in to the urge to establish some kind of human contact.

SATURDAY AFTERNOONS MY FATHER SAID THINGS LIKE “See how this chain fits itself into the teeth of the sprocket?” Home from a week’s traveling, he tinkered with motorcycles until dusk. He wore khakis and a sleeveless T-shirt. He bought the motorcycles second-hand—usually from someone who had taken a spill—and restored them. When we had renovated one to mint condition, he sold it, and we began renovating another. Frames hung from the garage’s rafters like carcasses. When we got a motorcycle whose rider had been killed, we salvaged the parts. My father wouldn’t rebuild those particular motorcycles, nor would he sell to a man with a family. He thought motorcycles were too dangerous for any family man besides himself. His favorite customers were men who had just enlisted. He would tell them to be very careful driving to Fort Bragg and would often talk to them about his own service days. He had been a Navy man, had almost re-enlisted. Before he closed each deal, he gave the buyer a list of maintenance tips and tune-up instructions that he made him promise to follow.

“And what about you?” one of them asked. “You still ride?” We had just sold a Triumph to a recruit. When the man toyed with the clutch, the machine jerked forward in a spasm.

“No. I don’t really ride anymore.” My father pointed at me and the house where my mother was emerging with tea. “I can’t afford the chance of taking a spill.” He considered our midnight rides not really riding but something else entirely.

My mother brought us tea in Mason jars; the man wobbled down the driveway and missed second gear. My parents had argued that morning over the promotion my father was to get after Labor Day. She had said that two months was a long time to wait for someone in her condition.

“Condition?” he had asked.

“I missed my period,” she had said.

“Here comes the new mother now,” my father said. “Here.” He helped her with the tray. He said that she should be careful carrying things, especially with two strong men around who could do things for her. All morning she had basked in my father’s unexpected attention. My father set down the tea and cornered her and gave her a hug and a nip at her ear.

“Baby money.” He presented her with a wad of cash. “What say I get some fat porterhouses and a bottle of wine. French stuff.”

“This isn’t a substitute for your being here, you know.”

Then she seemed to understand that she had spoiled the moment, and she rushed back inside the house.

“Pregnant women,” my father said. He gave me a wink.

“Should I put some potatoes on?” my mother called.

“The biggest you’ve got,” my father yelled. He looked down the driveway at something the recruit had dropped. My father went and picked up his handwritten instructions.

“He’ll probably forget to put oil in the crankcase, and seize it up,” he said as we walked to the back yard. My father poured charcoal briquettes into the grill, and I stacked them into a pyramid. “Stand back,” he said, and after dousing the charcoal with lighter fluid, he lit the fire. Leaning against the sides of the garage and the fence, scattered like giant cicada husks, were more motorcycles that my father’s hands would set into motion. My father got a sad pleasure from selling mint-condition motorcycles to people who, he feared, would ruin them.

LATE ONE SATURDAY NIGHT WE STRETCHED OUT ON A blanket in the back yard. My mother sat at the blanket’s edge and swayed to the music playing loudly in the kitchen. Louis Armstrong was ejecting lonesome notes from his horn. A box of light spilled out the door and held a portion of my mother. My father pointed out the constellations and gave them names.

“How about a dance?” he said, and gathered my mother up into his arms. When he dipped her, she giggled and hugged the back of his neck. They were two shadows, keeping cadence to Armstrong’s melody. Now and then my father stopped and looked up into the night sky. “We could travel to China, Richard, with that night sky and a little luck.” They resumed their sleepy dance, and I thought, If you dug down past the roots and the fossils and the dead, you’d hit another world. The idea that our disturbances were a small part of something as immense as the world was dizzying. Men had walked in space a few years before, floating dangerously out to rope’s length and then hauling themselves back, their feet searching for firm footing and balance in a realm where none could be found. This was how we were that summer.

“Do my back and shoulders,” my mother said. She had tired of dancing, and she sat where the light verged into shadows and darkness. My father loosened her blouse’s top button. He kneaded her muscles and called her his “girl.” She rubbed and stretched herself against his hands. Soon she fell asleep, and he carried her up the steps. “How about a ride?” he whispered to me as he stepped inside. When he came back out, he stood in the box of light and stretched. Now he said to me again, “How about a ride?” We pushed his Harley to the driveway’s edge, so as not to awaken her. The Harley grumbled and came to life with a kick.

My father coaxed the engine gently through the gears. We slid through the night like a snake through slick growth. My father eased into the turns with a knowing mo-

tion. He said once that you never really ride a motorcycle; instead you let it take you where it wants to go. We traveled for several hours, retracing the same tired path. We rode until the darkness eased into a notion that dawn would come. That night we circled wide of our sorrows.

"Here we go, Buck." The home stretch of a quarter of a mile was straight and streetlighted. My father turned off the headlight.

To ride a motorcycle at night is a simple thing; you become one with the darkness. The engine's motion works up through your crotch and settles in your chest. You feel caught up in the exhilaration of blind motion. I wore no helmet, and I had conversations with my father that occurred only in my mind.

I warned my father that my mother was doing the best she could but that he might lose her if he was not careful. I explained that people are different from motorcycles; you can't make them into what you want. I felt giddy being a father to my father. I assured him that we were all doing the best we could. I couldn't tell my father what I had learned that summer—that trying might not be enough. I understood that for a long time my mother had suspected this—that trying might not be enough—and had it been in her power to do so, she would have protected me from this sad knowledge. Instead I told him the biggest thing I knew—that my mother, by being at home safe and sleeping, was somehow giving me shelter from the sadness of motorcycles on a summer night. The two of us rushed

THE BLIND SEER OF AMBON

*Georg Everard Rumpf (1628?–1702), great Dutch naturalist,
who lived most of his life in the East Indies, and there wrote all his works and lost the sight of his eyes*

I always knew that I came from
another language

and now even when I can no longer see
I continue to arrive at words

but the leaves
and the shells were already here
and my fingers finding them echo
the untold light and depth

I was betrayed into my true calling
and denied in my advancement
I may have seemed somewhat strange
caring in my own time for living things
with no value that we know
languages wash over them one wave at a time

when the houses fell
in the earthquake
I lost my wife
and my daughter
it all roared and stood still
falling
where they were in the daylight

I named for my wife a flower
as though I could name a flower
my wife dark and luminous
and not there

I lost the drawings of the flowers
in fire

I lost the studies
of the flowers
my first six books in the sea

then I saw that the flowers themselves
were gone
they were indeed gone
I saw
that my wife was gone
then I saw that my daughter was gone
afterward my eyes themselves were gone

one day I was looking
at infinite small creatures
on the bright sand
and the next day is this
hearing after music

so this is the way I see now
I take a shell in my hand
new to itself and to me
I feel the thinness the warmth and the cold
I listen to the water
which is the story welling up
I remember the colors and their lives
everything takes me by surprise
it is all awake in the darkness

—W. S. Merwin

into the road ahead like two sleepers riding the back of a dream.

"Hell, let's just ride to China," my father always said at our driveway. He slapped his pants pocket, claiming that with his change and a few bills we could make it. He was very proud of his motorcycle's gas mileage. "We *could* get there." *There* covered all the possibilities of where we might be headed.

SUNDAY MORNING I OFTEN JOINED MY PARENTS IN their room. My father snored while my mother read romances. Reading comforted her in much the same way that blowing smoke rings at the screen seemed to comfort her. She was trying to hold things together, warding off depression by intoxicating herself with books whose endings were not surprises. She read romance after romance, all of whose covers pictured forlorn women about to be saved by gentlemen striding confidently out of the background. As she read to me, I watched my father sleep, wondering if she were somehow interpreting his dreams. When he awoke, he scratched his chest and propped himself on a pillow while she gave us a synopsis of this or that book.

"This promising and beautiful young woman is engaged to a doctor. She really loves a poor but honest young butler. He is a servant in the aging doctor's household. It turns out the young butler is the only living heir to a diamond fortune. Mr. Chadworth, a trusted aide to the dying diamond magnate, is commanded to find the last living heir. He successfully locates the butler. She and the butler marry and have a happy life."

"Sounds nice," my father said. "I like to hear you tell us stories." He was up and choosing clothes for his suitcase. "Too bad things are often different."

"Too bad, isn't it." I heard an edge in my mother's voice.

DURING THE WEEK, MY MOTHER LEFT THE HOUSE only at night. We took her car after dark and bought groceries at a grocery store open until ten. My mother drove with the window up, though the air-conditioner was broken. She stopped at each intersection and then proceeded in screeching spurts. Once past an intersection, she drove slowly, to avoid any possibility of an accident.

We talked on these rides to the store, my mother usually fretting over my father's absence.

"Just let him get his promotion," I said.

"I'm not worried," my mother said. "Another baby will make him stay at home, I bet."

I said it probably would.

"Do I ruin things when he's at home?"

"Not that I know of."

"It's been a good few weeks, hasn't it?"

"Very good," I said.

"It's too early for me to start showing. You understand that, don't you?"

Another time, she said, "I hear you on that motorcycle late Saturday nights. Whatever on earth do you do?"

"We just ride."

"Just ride?"

"Yeah. It's like all of us being on the bed when you tell a story. It's like early morning when we share a cigarette while I'm glazing."

THE LAST SATURDAY OF THAT MONTH, WHILE MY mother visited her psychiatrist, my father and I hunted arrowheads. We took his Harley out to a field with a stone outcropping where the Indians had gotten flint for arrowheads. We parked the motorcycle beside a road sign that warned of low-flying airplanes. A mile away an airstrip for crop dusters had been cut from the tobacco fields and a tract of pine. The planes took off slowly and wobbled in low over the fields of tobacco, spraying them and then floating straight upward where the field gave way to the pines. We were far enough away for a lag to occur between the sight of the plane's rising and the sound of the pilot's gunning the motor. In the far distance cars on the interstate we had exited moved at a sleepy speed. My father and I spread out through the field and poked at the earth's raw redness. It had rained that morning, and humidity made the air seem as heavy as the mud on my shoes. We made several passes through the field, our paths slowly coiling to its center. When airplane shadows passed over me, I had the urge to run catch them and jump on them like a magic carpet. My father and I always met under a pine tree left for shade in the years when the field was planted with tobacco and the workers needed a spot to rest from the sun.

My father got excited when he found an unfinished arrowhead. "This old boy sure knew what he was doing." He showed me a tip with one side left unfinished.

"I think we can do it better," he said. He took out his pocket knife with the bone handle. He began pressure-flaking at what some Indian had abandoned three centuries earlier. My father squatted on his hams. His veins grew into a web as he tried to remove the flakes in exactly the right places. Now and then he struck the arrowhead a quick tap. Earlier that morning he had argued with my mother, accusing her of blaming him for things that were beyond his control. My father's knife *tick-tick-ticked*, and he seemed a child again, fumbling to make something whose exact shape he was still trying to discover.

INSTEAD OF A PROMOTION THEY GAVE MY FATHER RESPONSIBILITY for half the state of Tennessee. This meant he would be gone even more. The whole Saturday morning of Labor Day weekend he refused to talk. Instead he cleaned and recleaned his Harley's spark plugs. Then he readjusted their gap. He cranked the engine

again and again, listening to the cylinders' compression. Then he attached the plugs and laid them against the casing. He kicked the starter to watch their arc.

"It's my fault," my mother said. She came out from the bedroom to stand behind me where I stood at the kitchen door, watching. She had the box of photographs under her arm and a note in her hand. She told me to give the note to my father. Then she locked herself in the bedroom.

I read the note and then carried it to my father. The note said, "You've been doubting that you love me for some time now. If it's another mouth to feed that you're worried about, don't. I just made the baby up."

"Here," I said. He stuck it in his pocket. He had the plugs back in and was working degreaser into his hands.

"You might want to read it now."

He read it and threw down the rag with which he was cleaning away the loosened grease. When I got into the house, he was banging on the bedroom door.

"For God's sake, open up," my father said.

"Just leave," my mother said. "Love me or leave me, but the way things are now has to stop."

"Why did you claim to be *pregnant*? Just to trick me?"

"Didn't you notice how things changed when you thought I was pregnant?"

"Open up right now," my father said. "You hear me? Open up right this minute."

"I'm not coming out until you calm down," my mother said. "I might not even come out until this afternoon." She started slipping the faceless pictures of herself under the door.

"What in the hell is this supposed to mean?" he asked.

"It's how I feel. Have you spent so much time traveling that you can't understand *that*?"

"I understand one thing—it's time for a change. I'm taking my son with me, and I'm going to get drunk. D-R-U-N-K." He led me from the house to the Harley.

MY FATHER DIDN'T GET DRUNK THAT NIGHT, BUT by nightfall we had made the Appalachians. My father stopped at a tourist trap named Blowing Rock. It was near a road tunnel that fed through the mountains into Tennessee. We parked by an information sign that told of the legend of Blowing Rock. An Indian maiden jumped, and her lover, returning late from the hunt, saw her fall. He prayed so hard as she tumbled in the wind that God heard, and He blew her back up to the cliff's edge and safety.

"What the hell," my father said. "An Indian Lover's Leap." The sign said that this legend explained why anything thrown off Blowing Rock rose back up. On a windy day it could snow *upward* here.

My father stood near the guardrail and scratched his head. He pulled a cigar from his jacket and licked and puffed at it. He held himself to three a week. "This is the best way to taste a cigar," he said, and I didn't know if he would light it. Finally he did.

"Sometimes I believe she does everything in her power to drive me away. Richard, I never bargained for a crazy woman, even if I *do* love her. The hell of it is, I never once thought it would turn out this way." The cigar glowed and blinked at intervals. "There goes my own business," he said. "Tennessee." He pointed toward the darkness where the mountains, though invisible, could be felt.

"It's not like you've really been home a lot," I said.

"Well, they sure fixed that problem for me, didn't they. I can't work for them after they throw me stinking Tennessee." He looked at me with bewilderment. "Richard, what if your mother and I *can't* make a go of it?"

My father reached into his pockets and gathered his change. With his head making an arc of light, he motioned me to follow. "Let's try this out, Buck." He leaned over the guardrail. He pitched coin after coin off the mountain's edge, leaning as far as he could to watch where they went. We felt no wind that night, and of course they did not rise. After the coins he tried rocks and sticks and even paper cups rummaged from the trash bin. In the moonless night he was a shadow gathering pieces and tossing them off. Each object was sucked from sight as it fell. He stood there, a man tossing things off a mountainside, caught in the human hope that they would rise again as promised. The night was as dark as I imagined the far side of the moon might be. The thought occurred to me that though we could, we wouldn't keep going west; we had gone as far as it was possible to go and still turn back.

My father crushed the cigar near the motorcycle. "Climb aboard, Buck." We drove to the main highway and turned toward home. I thought of how the road leading down from the mountainside was steep and dangerous. Around one bend or another would lie a blind curve whose far side held secret what might or might not be. As we approached that curve there would arise in us a steady drumming. Our chests would swell and throb until our pulse beat in the quicks of our fingertips. We were blood-full of the moment wherein, against all probabilities, you lean into the curve and take your chances of making it. You feel earthbound, not by the motorcycle but by your urge to round that bend. Oil slick or happy ending, complete with a hero's welcome, you ease into that snake of road whose other side holds your future hidden. This moment is what men love for. You are father and son, caught in a homeward motion.

"Hold on," my father said, and we went at that curve with all the speed and hope that we could muster. □

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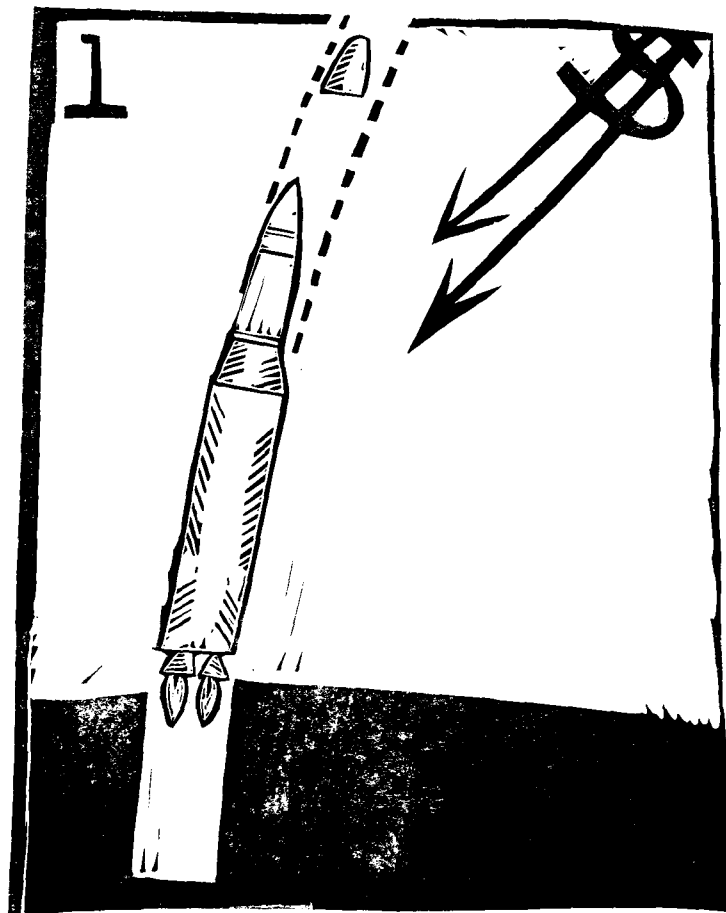
How the Administration is defying scientific opinion, bypassing internal Pentagon review procedures, stalling Congress, and pressuring the military in its effort to field a "first generation" space-based missile defense within a decade

THE RUSH TO DEPLOY SDI

BY CHARLES E. BENNETT

PRESIDENT RONALD Reagan has a historic opportunity to reduce the world's arsenals of strategic nuclear weapons significantly and to prevent the arms race from escalating into space. The deal that was almost struck at the 1986 superpower summit in Reykjavik is still within reach—a 50 percent reduction in offensive strategic weapons and an agreement to abide by the 1972 anti-ballistic-missile (ABM) treaty for ten years. During last December's summit meeting in Washington the two superpowers agreed, in effect, to disagree on strategic defenses. The Soviets rejected U.S. proposals to allow "testing in space as required" and to allow deployment of space weapons. The United States, in turn, rejected Soviet proposals for strict adherence to the ABM treaty. The compromise—a carefully worded statement allowing each nation to proceed "as required" on development of space weapons within the ABM treaty—merely "kicked the can down the road," as Max Kampelman, the chief U.S. arms negotiator, observed.

While the President must certainly continue to be firm in negotiations with the Soviets, he should not be crippled by the mistaken belief that we now have, or soon could have, technology capable of protecting us from nuclear missiles. If existing technology could meet this noble goal, bargaining it away in return for reductions in offensive missiles might not be wise. But independent expert opinion is nearly unanimous: at least a decade of research is required before we can know if effective missile defenses are tech-



nologically even possible. The Soviet Union and the United States could maintain the ABM treaty limitations without impairing long-term research efforts. However, instead of a deliberate, prudent research program on the feasibility of shooting down incoming nuclear warheads, the Strategic Defense Initiative (SDI) has become a program for building and deploying a specific weapons system within the next decade.

As a conservative southern Democrat and a combat veteran of the Second World War, I have supported increased funding for our national defense, particularly for improving our conventional forces, throughout my forty years in the House of Representatives. In these times of tight budgets, however, I believe we should not shift precious defense dollars to programs with little real military value when urgent conventional defense needs are left unfunded.

SDI ceased to be an "initiative" and became a "system" last September, when the Department of Defense gave the go-ahead for the rapid development of Phase I of a "strategic defense system," or SDS. This is not the "peace shield" that President Reagan envisioned. At best, it will be capable of stopping a small percentage of nuclear warheads. SDS Phase I will rely not on the lasers and other beam weapons depicted in the cartoon images on television but on hundreds of satellites containing small interceptor rockets known as space-based interceptors.

A significant effort is being made by a small group of Administration officials and defense contractors to institu-

tionalize the SDS, in order to assure that the program will proceed regardless of its scientific or strategic merit. The goal is to begin “bending metal”—converting defense dollars into job-based political support—and make SDS “Congress-proof.” The political-industrial complex is applying pressure to achieve a position in which there will be no turning back from what proper research may well discover to be a trillion-dollar Maginot Line. The process has occurred so rapidly and so quietly that most members of Congress and most of the American people do not yet realize what has happened.

For example, last June the Strategic Defense Initiative Organization, as the special Pentagon office in charge of SDI is known, and the Air Force Systems Command awarded contracts totaling nearly \$1 billion to begin building prototype “Star Wars” weapons. Rockwell International, the nation’s fourth largest defense contractor, won two contracts with a long-term value of \$358 million, for planning, hardware development, and flight testing in the early 1990s of a space-based interceptor. Martin Marietta, the nation’s eleventh largest defense contractor, received a \$23 million contract, with options for an additional \$126 million, for development and ground-testing projects in the space-based interceptor program. McDonnell Douglas, the third largest defense contractor, won a \$481 million contract (later canceled) to build hardware for a key space experiment with a neutral-particle-beam weapon. These prime contracts include subcontracts for General Electric, LTV, TRW, and Boeing Aerospace.

And there is more to come. Last January, Martin Marietta grabbed a \$500 million contract to design and operate a giant national complex to test SDI systems. A contractor will soon be selected to serve as the system engineer of SDS. The prize is a huge contract, worth \$1.2 billion. This will be followed by further lucrative contracts for designing and, more profitably, building the thousands of weapons needed for the Phase I deployment, which the SDI Organization estimates will cost \$75 billion to \$150 billion. Wolfgang Demisch, a defense-market analyst, has said, “SDI is the future of the defense industry. . . . The traditional defense budget clearly isn’t going to grow much in the near future. Every company is on notice that if they want to be a long-term player, they can’t let SDI get away.”

The art of turning concept into defense dollars is to redefine the requirement to fit the product. As it became clear that it will be impossible to protect the population of the United States against Soviet intercontinental ballistic missiles (ICBMs), at least in this century, the leadership of SDI restructured the program last year to redirect research from “exotic” technologies, such as lasers and other beam weapons, and toward development of more primitive rocket-powered weapons. The President’s original “astrodome” vision is considered only the “ultimate” goal. The SDI Organization now says that “the phased deployment of the Strategic Defense System . . . has been conceived as the most reasonable means to achieve the levels of defense contemplated by the President’s 1983 direction.”

The goal now is to “reduce Soviet confidence in the military utility of its ballistic missile force” and to “complicate Soviet attack plans.” Specifically, “the deployment of the Phase I SDS will compel Soviet operational adjustments and compromises by reducing the confidence of Soviet planners in predicting the outcome of a ballistic missile attack.” This is a long way from being able, as President Reagan promised a 1986 high school graduating class, “to put in space a shield that missiles could not penetrate—a shield that could protect us from nuclear missiles just as a roof protects a family from rain.”

The shift from a “shield” to a complication in Soviet attack plans is crucial. But even proponents no longer speak of an impenetrable shield. SDI must now be judged against other systems that complicate attack plans, such as mobile ICBMs, cruise missiles, and our nearly invulnerable Trident submarines.

How SDI Works

THE MAIN MISSION OF SDI IS TO STOP SOVIET INTERCONTINENTAL ballistic missiles. An ICBM has four main phases in its flight. In the *boost* phase, which lasts a few minutes, the ICBM’s rocket boosters propel the missile above the earth’s atmosphere. In the *post-boost* and *midcourse* phases, which together last some twenty to thirty minutes, the multiple nuclear warheads of each missile are released and travel through outer space toward their separate targets. The most modern Soviet ICBMs could release ten or more warheads along with “decoys” to fool enemy defensive weaponry. In the *terminal*, or *re-entry*, phase, which lasts less than a minute, the warheads decelerate as they re-enter the earth’s atmosphere, and finally they reach their targets and detonate.

The case for Star Wars begins logically: The best time to destroy a Soviet ICBM is in the boost phase. The ICBM itself has a large, fiery rocket plume, making it easy to see, and it carries large amounts of highly explosive fuel, making it potentially easy to destroy. What’s more, a single U.S. shot could destroy ten Soviet bombs.

Unfortunately, the boost phase lasts a brief three to five minutes. To destroy Soviet ICBMs so quickly, the SDI Organization plans to have weapons already in space, on satellites, when the Soviet attack begins. These satellites must carry weaponry that can aim, fire, and hit the target within a few minutes. Lieutenant General James Abrahamson, the head of the SDI Organization, told Congress last summer that the system would have only forty to a hundred seconds to decide to react after the Soviets launched their ICBMs. He maintained, nonetheless, that his research so far indicated that such a “decision timeline is feasible” and would still allow for human control over the process.

In a series of setbacks, technology after technology has been considered for this demanding mission and rejected by SDI scientists. The most significant setback concerns chemical lasers, which shoot intense beams of light travel-

ing 186,000 miles per second. These were the most mature of all the directed-energy technologies being considered, but scientists no longer think they are promising in the near term. Nonetheless, the SDI Organization may yet propose these lasers for early deployment. Other impressive high-technology systems that once received much publicity include neutral-particle beams and the nuclear-pumped x-ray laser. However, a panel of the American Physical Society, in the most definitive study yet done on directed-energy weapons, examined all the relevant classified information and concluded unanimously:

We estimate that even in the best of circumstances, a decade or more of intensive research would be required to provide the technical knowledge needed for an informed decision about the potential effectiveness and survivability of directed energy weapon systems. In addition, the important issues of overall system integration and effectiveness depend critically upon information that, to our knowledge, does not yet exist.

The prime remaining candidate possibly available in this century for boost-phase defense is space-based chemical rockets, along the lines of the fleet of 432 rocket-launching satellites orbiting the earth proposed by the group High Frontier. However, that system was repeatedly rejected by Administration experts. In a September, 1981, memo Herbert Reynolds, then the Department of Defense's deputy director for intelligence and space policy, called the concept "one vu-graph deep" and concluded that the need to rely on "hair-trigger" computer-based reaction time "alone might be enough to reject the concept, even if the system could do the job as advertised." In 1982 Secretary of Defense Caspar Weinberger criticized the scheme after a thorough Department of Defense review concluded, "It is the unanimous opinion of the Air Force technical community that the High Frontier proposals are unrealistic regarding state of technology, cost and schedule." The President's Commission on Strategic Forces, known as the Scowcroft Commission, reported in April of 1983 that "applications of current technology offer no real promise of being able to defend the United States against massive nuclear attack in this century." The U.S. Air Force studied and abandoned a system of this type in the 1960s, in a project nicknamed BAMBI (for ballistic-missile boost interceptor), which called for rockets strikingly similar to those planned for the SDI system. Nonetheless, the SDI Organization has decided to work toward deploying the High Frontier defense early in the next decade.

Officially there has not yet been a decision to deploy the system. But Secretary of Defense Weinberger said in March of last year, "The basic decision that we want to deploy has been made long ago." When the SDI officials reported to Congress last year on these interceptor rockets—then known as space-based kinetic-kill vehicles, or SBKKVs—they focused on a "series of achievements in excess of what was expected" which proved that "a SBKKV system can be built" and that the "technical feasibility of a near term SBKKV [has been] established."

Congress wanted no part of that scheme, which would violate the ABM treaty. Last year both the House and the Senate voted to cut back the budget increase for SDI requested by the Administration and to require adherence to the traditional interpretation of the ABM treaty—thereby restricting Star Wars tests. Further, the House rejected an accelerated development and deployment schedule designed to make SDI operational by 1993, by an overwhelming vote (302–121). In last year's continuing resolution Congress barred any funds for the full-scale development and deployment of any space-based interceptor system during 1988.

But SDI officials forged ahead. The dispersal of \$1 billion in contracts was timed nicely to precede the July meeting of the Department of Defense's Acquisition Board, at which the SDI program underwent its first formal Pentagon review. After intense debate, including charges that crucial information damaging to SDI was being withheld from the board, six key SDI projects were granted Milestone I approval. This meant that the program could move from concept research and development to hardware demonstration and concept "validation." Thanks to strong support from the White House and from Weinberger, the program's proponents were able to dodge hard questions as to how SDI should be shaped, how it should proceed, and how strategic defense should fit into the overall U.S. military force structure. This political pressure enabled SDI to circumvent the basic deliberative processes of the defense board.

How SDS Works

WHAT DOES THE NEW SYSTEM LOOK LIKE? BY JULY, SDI officials had settled on its architecture, although it was not final (and many aspects are classified). The figures cited below for each system are taken from published reports and a plan proposed by the Sparta Corporation, one of the companies contracted to design SDS. This "first generation" defense includes

- 3,000–5,000 space-based interceptors (SBIs), carried in hundreds of "garages" placed in orbit, for boost-phase intercept
- 30 boost-phase surveillance and tracking satellites
- 20–80 space-based surveillance and tracking satellites to track warheads during their midcourse flight
- 2,000 ground-based rockets called ERIS (for exo-atmospheric re-entry vehicle interception system) for late-midcourse intercept
- 100 ground-based "pop-up" surveillance systems on missiles
- a network of battle-management and command, control, and communications satellites to serve as the "brains" of the system

The SDI Organization intends during fiscal years 1988 and 1989 to spend 50 percent of its budget—or almost \$2 billion in fiscal year 1988—demonstrating the technological validity of these Phase I weapons. Before leaving the

Pentagon, Weinberger gave this system another push forward with two orders promulgated in November of last year. The first helped establish the system as a group of weapons heading for production: "Now that . . . Phase I has entered the acquisition process," Weinberger said, "operational test and evaluation activities must begin immediately. . . ." To make sure that unfavorable test results, concerns of his successor, or congressional actions did not slow down the frantic deployment schedule of SDS, Weinberger fired off a second order exempting SDI from "all DOD routine bureaucratic procedures."

This Phase I system would not be a population defense. Its primary mission would be to protect U.S. strategic nuclear forces and other military assets. General Abrahamson assured the House Armed Services Committee that this type of system would still provide population defense, because "we are trying to find an effective way, first, to prevent war by complicating the Soviet attack plans, complicating them to such an extent that the uncertainty level will be high enough that they will not strike. So that is the most important thing. And by the way, then it is perfect, clearly perfect, if we can do that."

But, of course, even SDI officials admit that SDS would not be perfect. After spending at least \$100 billion and launching hundreds of satellites into orbit, we would still be only at the beginning. The SDI Organization envisions "generations" of weapons deployed in waves stretching well into the twenty-first century. The contractor study noted above, for example, anticipates that the first lasers or other directed-energy weapons would be deployed no earlier than 2010.

A Senate study estimated that if this system were rushed to deployment by the mid-1990s, it "would have an effectiveness against Soviet ballistic missile warheads of no more than 16%." That is, 84 percent of the Soviet warheads would come through unscathed. The American Physical Society council warned, last April, that "even a very small percentage of nuclear weapons penetrating a defensive system would cause human suffering and death far beyond that ever before seen on this planet."

The Senate investigators found agreement among SDI scientists that substantial increases in funding would be needed to overcome the tremendous technical obstacles and that fairly soon after deployment the Soviets could develop countermeasures to overcome the system. This was confirmed by the Defense Acquisition Board. If the next phase of SDI were not then ready to go up into space, one SDI scientist said, "you may well end up with a more destabilizing situation than before."

Disinformation

THROUGHOUT THE RAPID GROWTH OF SDI VERY LITTLE candid information has been forthcoming from the SDI leadership to Congress, to responsible Department of Defense officials, and perhaps even to the President himself.

Last October documents became public charging that the physicist Edward Teller, one of the first to convince the President of the feasibility of SDI, and the SDI scientist Dr. Lowell Wood gave "overly optimistic" and "technically inaccurate" information regarding the x-ray laser to the nation's highest policy-makers. The author of the charge is Roy Woodruff, a highly respected scientist who resigned in protest from his post as head of the weapons programs at the Lawrence Livermore National Laboratory, in California.

Woodruff strongly supports SDI research but says that "it has to be responsibly portrayed to the nation's senior policy-makers." He adds that the "vision of a leakproof shield that makes nuclear weapons impotent and obsolete is not a practical reality." Briefings from Teller and Wood may have led President Reagan and other high officials to believe that a wonder weapon—the x-ray laser—capable of obliterating hundreds of missiles in a single burst was close to becoming a reality. This misinformation may have greatly influenced Reagan's negotiating position at the U.S.-Soviet summit in Iceland, as well as his position on redefining the ABM treaty, and it may be coloring current negotiations with the Soviets. But Woodruff and other scientists agree: the x-ray laser does not work now, and it will be five to ten years before we can even know if such a weapon is feasible.

Equally serious, a key recommendation from the Defense Department's Defense Science Board was removed before the report was given to the Defense Acquisition Board as part of the basis for its deliberations on SDI last summer. Reportedly under pressure from senior Pentagon officials, the science-advisory-panel chairman removed sharp criticism of the SDI plan. The uncensored report noted that "there is presently no way of confidently assessing" the system's price or its effectiveness. The science panel recommended delaying approval for "the next year or two" while SDI officials filled in "gaps in system design and key technologies." The acquisition board never got this recommendation, and the plan was approved.

The Joint Chiefs of Staff also have serious doubts about SDI, but these are muted in the face of White House pressure. For example, the SDS deployment plan was unable to proceed unless, like all other weapons programs, it won agreement from the Joint Chiefs of Staff that it met a legitimate military requirement. Reportedly, SDI officials requested a statement of the military's need for SDS, but the Joint Chiefs said they required only a research program. Finally, a few days before the Defense Acquisition Board review began and despite military concern that SDI will absorb billions of dollars that should go to other, more pressing conventional-weapons programs, the Joint Chiefs returned a military requirement for the protection of our nation's strategic military assets.

That was enough—barely—to fulfill the procedural requirements of the acquisition process, and SDS was officially blessed.

Unanswered Questions

SDI OFFICIALS HAVE GIVEN CONGRESS A SHIFTING STORY about SDI over the years, despite repeatedly imposed requirements for specific reports. Few members find the SDI reports useful, yet we are asked to authorize billions of dollars annually on the basis of them. Before rushing into deployment of SDS or any phase of SDI, we need to have the following questions answered:

How would a potential enemy respond if SDI were carried out to procurement and deployment? What increase may be anticipated in the number or quality of enemy offensive weapons, which would be intended to penetrate the defensive shield?

What can be expected from an enemy in the deployment of weapons not endangered by SDI, such as cruise missiles and low-trajectory submarine-launched missiles?

How vulnerable is SDI to a potential enemy's anti-satellite weapons?

What are the cost estimates for the research program for SDI?

A requirement that these questions be answered was enacted into law by Congress in 1985. The questions were addressed to the Department of Defense, which has yet to answer them substantially, although the statute required it to do so two years ago.

The answer to the first question is obvious: the enemy would increase the number of its warheads and missiles. Two decades ago then Secretary of Defense Robert McNamara argued that the United States would counter any Soviet anti-ballistic-missile system by greatly expanding the number of U.S. warheads. Former Secretary of Defense James Schlesinger has said, "Remember the 1960s, and Secretary McNamara's reaction to the Soviet ABM system. Are the Soviets likely to be any less 'offensive-conservative' than we were then? How likely is it that in the event of an American deployment of substantial strategic defense, the Soviets would agree to a constraint on offensive capabilities?" As for how large an increase the Soviets can make in their ICBM force, the Library of Congress estimates that staying within current or currently envisioned production rates, the Soviets could add between 5,000 and

22,000 warheads to their current ICBM force of 6,440 warheads by the year 2000.

Proponents of early deployment argue the contrary: that defenses will be inexpensive and effective enough that it will become easier to trade away existing offensive weapons and less attractive to build additional ones. If the cost of offensive weapons is greater than the cost of defenses, they say, then the U.S. deployment of defenses might force the Soviet Union to give up its offensive capability.

Unfortunately, most studies indicate just the opposite. The cost-exchange ratio of even highly effective defenses

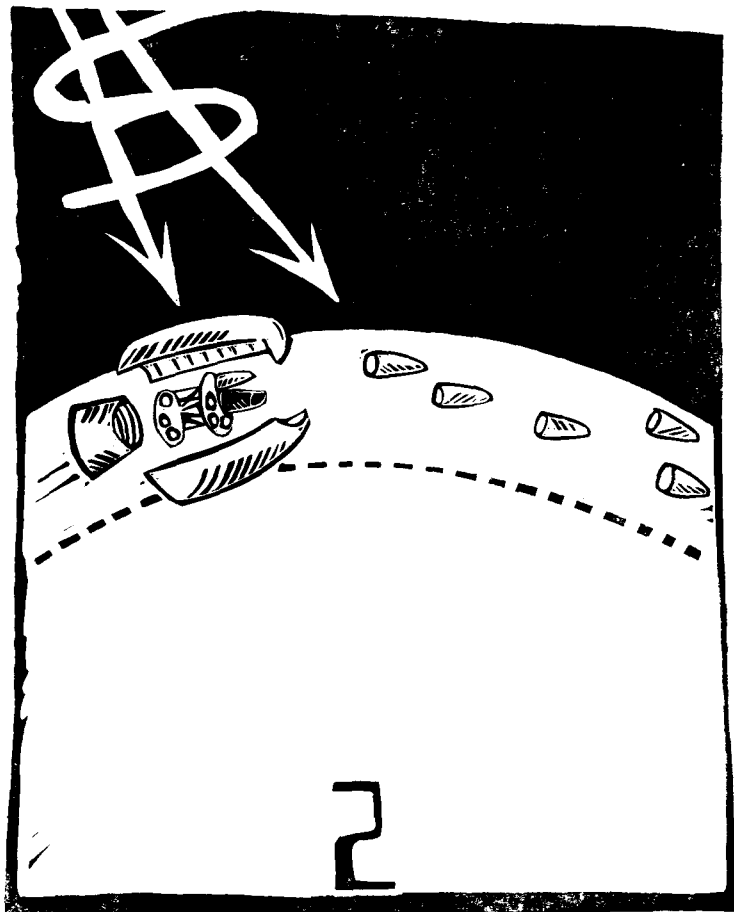
still favors the offense. As we shall discuss, the technologies planned for Phase I deployment can be overcome quite cheaply. Even if future technological breakthroughs favor the defense, a superpower believing that its fundamental security is threatened by the adversary's defense will likely be willing to pay any amount to defeat it.

Sayre Stevens, a former high official of the CIA, concludes, "The Soviets will do what they have done in the past: spend money and allocate scarce resources to the extent that they are required by the military demands they find facing them. Thus, a vision of the world of 2000-2010 emerges in which both the United States and the Soviet Union are actively

engaged in the significant upgrading of both offensive and defensive weapons systems."

What else will the Soviets do? They will most likely take other actions designed to overcome any SDI system at all three phases: boost, midcourse, and terminal.

THE FAST-BURN BOOSTER HAS BROAD UTILITY FOR countering an interim SDI system. A fast-burn booster is an ICBM booster with an enlarged rocket nozzle and fuel modified to burn at an increased rate. The result is a reduced boost time of 100 to 150 seconds, or even less, as compared with the normal boost time of 180 to 300 seconds. Boost-phase interception by space-based interceptors then becomes virtually impossible, since most of the fast-burn boosters will release the payloads of de-



coys and warheads before SBIs can reach them. The fast-burn booster is old technology. Far more stringent requirements were met by the rocket motors in the U.S. Sprint ABM interceptors of the 1960s. The Soviets are already moving to faster-burning boosters in their newest ICBMs, the SS-24 and the SS-25. Stephen Rockwood, the former director of SDI research at Los Alamos National Laboratory, agrees that fast-burn boosters put "chemical rockets out of business fairly quickly." Louis Marquet, the former SDI deputy director for technology, has admitted that "fast-burn boosters . . . could rise up and deploy their vehicles before the kinetic-energy interceptors could reach them." The former Secretary of Defense Harold Brown asserts unequivocally, "Fast-burning boosters would effectively negate such a defense system [space-based interceptors]."

The boost phases of the new Soviet SS-24 and SS-25 last about 180 seconds. A recent study by the Lawrence Livermore National Laboratory indicates that an SDI system composed of a few thousand interceptors would be no more than about 20 percent effective against the Soviet threat that is now projected for the mid-1990s. This pessimistic conclusion is achieved in spite of three optimistic assumptions: that the interceptors would be launched within twenty to thirty seconds of a Soviet attack, that each interceptor would have a 90 percent probability of destroying its target, and that the Soviets would not have modified their missiles or taken any countermeasures in response to the deployment of U.S. space weapons.

Boost-phase defense has a more serious flaw, one shared by all space-based systems. In the words of Edward Teller, "I believe we should not deploy weapons in space. . . . To put objects into space is expensive. To destroy space-objects is relatively easy."

Even if the technology of the SDI system is capable of overcoming the proliferation of warheads and fast-burn boosters, the satellites the system needs for target identification and battle management, and also the "garages," will be vulnerable to a variety of anti-satellite systems. The enemy would not have to attack all the satellites but only those, such as the battle-management stations, that were critical to the operation of the system. Spies might provide the information that would enable the enemy to pinpoint the system's weak points, or might sabotage the computer programs necessary for the system to function. Just last October federal agents uncovered a plot by three men in California to sell Moscow supercomputer technology applicable to Star Wars systems.

According to a Soviet general as he was quoted by Tass, the likely Soviet responses to SDI would include the "destruction of SDI components such as orbiting battle stations and space-based battle-management systems as the most effective way of weakening the entire missile defense dramatically."

In the low earth orbits, 200 to 800 miles up, necessary to carry out boost-phase intercept (forgetting for the moment the problem of fast-burn boosters), the SDI system's components will be vulnerable to a wide variety of current and

future anti-satellite weapons. Unless there is an arms-control treaty banning the development of anti-satellite weapons by either side, the Soviets "could have prototype space-based anti-satellite laser weapons by the early 1990s," according to Robert Gates, the deputy director of the CIA—the same time at which proponents of the SDI system predict initial deployment. Some officials, including General John Piotrowski, the commander of the North American Aerospace Defense Command, believe that the Soviets already have ground-based lasers powerful enough to destroy existing unhardened, low-orbiting U.S. satellites and to damage those higher up. Of course, SDI systems themselves have an inherent anti-satellite capability. "It continues to appear that everything that works well as a defense also works somewhat better as a defense suppressor," Harold Brown says.

Scientists at one of the nation's primary nuclear-weapons laboratories, Sandia National Laboratories, have been studying the question of satellites' vulnerability and have concluded that space-based defenses can never be made "survivable." Curtis Hines, a departmental manager for systems analysis at Sandia, has said, "I think boost-phase [defense] may be out of the question." Robert Cooper, the former head of the Defense Advanced Research Projects Agency in the Reagan Administration, told the House Armed Services Committee last spring that there are "substantial problems" with making space-based defenses survivable and that "one has great difficulty in convincing oneself" that it could be done. He didn't see survivability measures on the horizon, he testified, that could justify early deployment.

THIS LEAVES THE MIDCOURSE AND TERMINAL PHASES as potential times to stop Soviet ICBMs. In these phases the United States will have to shoot down Soviet nuclear warheads after they have separated from the rest of the ICBM. Yet these warheads are only a few feet long, travel four miles per second, have no easily identifiable fiery plume, and are protected by a heat shield capable of withstanding re-entry into the earth's atmosphere. They are not easy targets.

In addition, the Soviets could deploy hundreds of thousands of decoys along with the tens of thousands of warheads. The decoys would probably consist of cheap aluminized Mylar balloons. The warheads themselves could be encased in the same balloons, so that warheads and decoys would look exactly the same. The decoys can be carried in much larger numbers on ICBMs, because they are much lighter than actual nuclear warheads. In the vacuum of outer space, heavy warheads and light decoys would travel at the same speed.

If the United States is to have a chance of destroying Soviet warheads as they travel through outer space, the real warheads must be distinguishable from the decoys—there is neither time nor weaponry enough to shoot them all down. Yet recent studies by Pentagon scientists have

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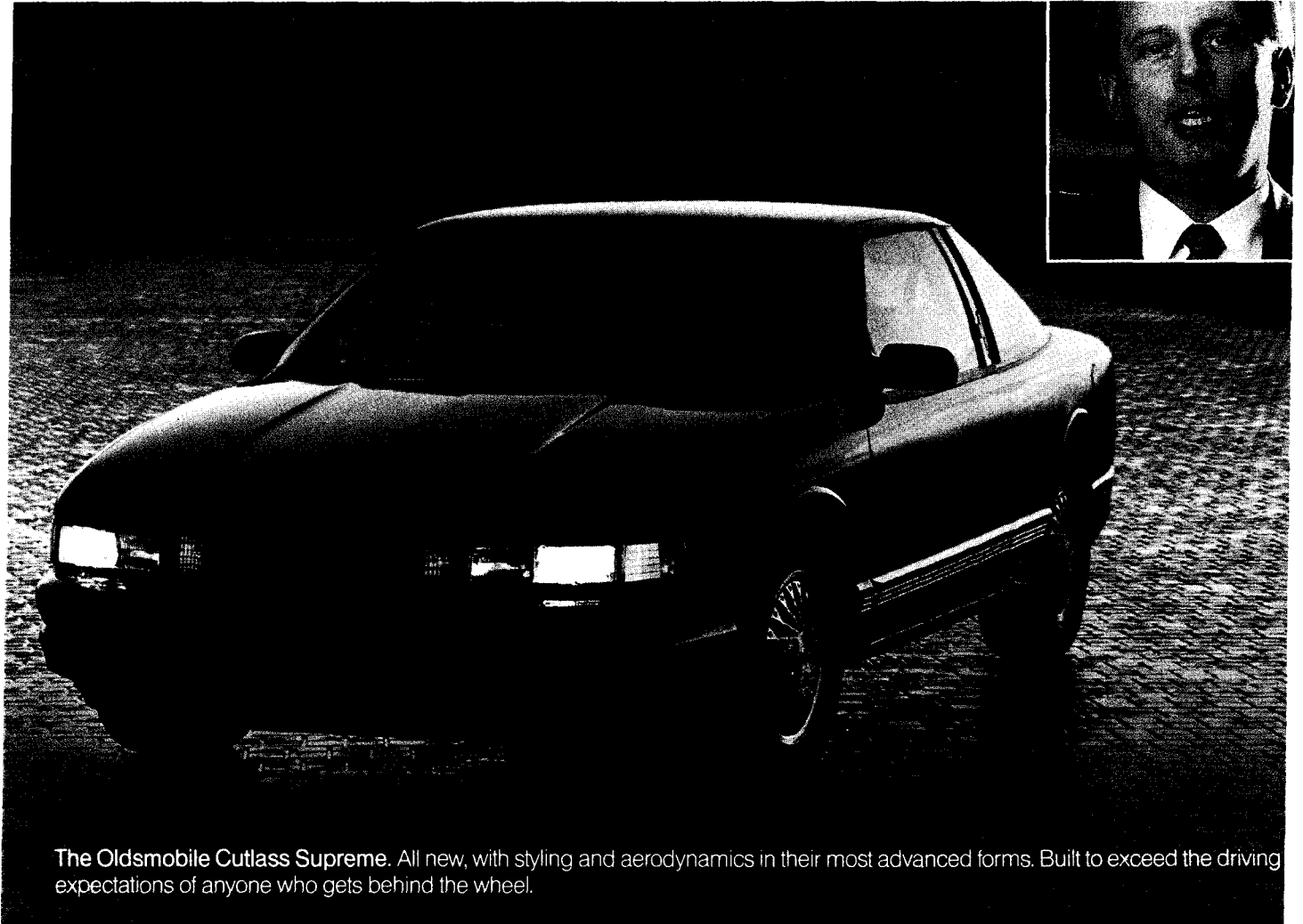
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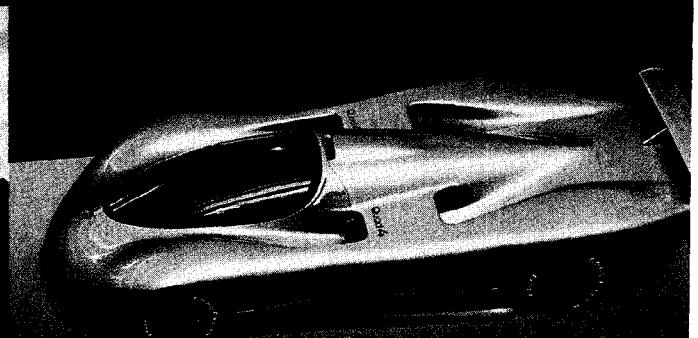
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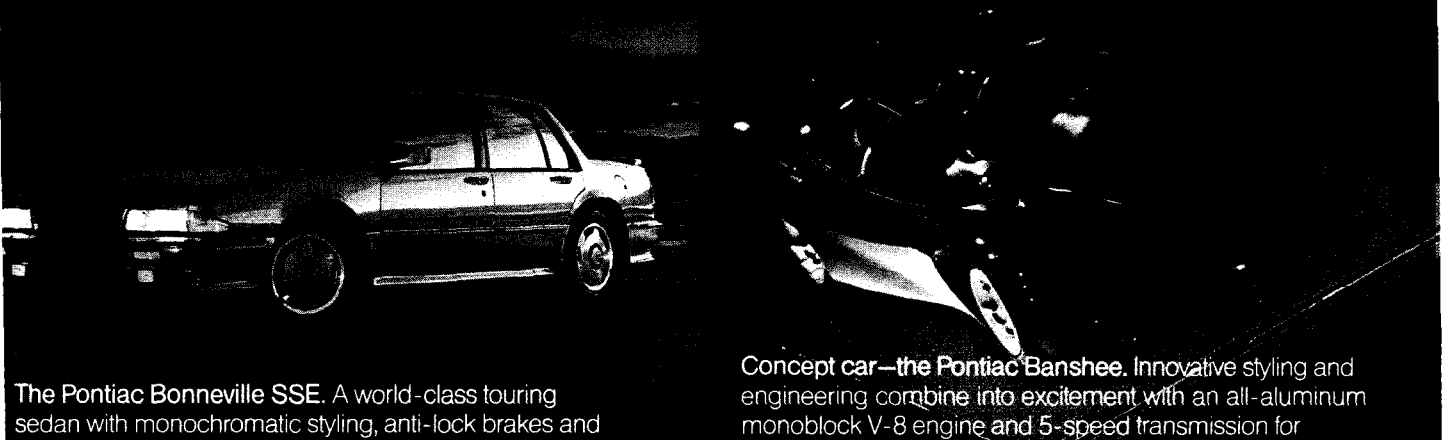
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The Pontiac Bonneville SSE. A world-class touring sedan with monochromatic styling, anti-lock brakes and a host of innovations built in to standard equipment.

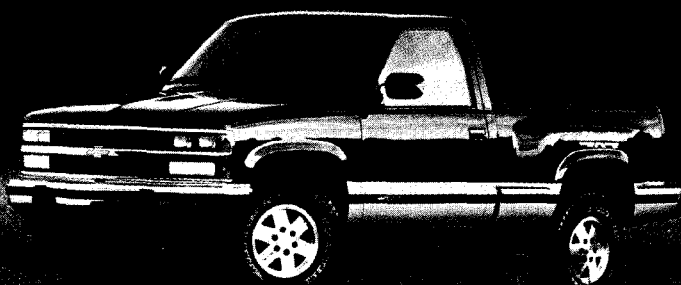
Concept car—the Pontiac Banshee. Innovative styling and engineering combine into excitement with an all-aluminum monoblock V-8 engine and 5-speed transmission for

CHEVROLET

The heartbeat of America. It's mainstream U.S.A., long on value and short on pretense. Forever young and on top of that—it's just plain fun.



The Chevrolet Beretta. One of the most beautiful shapes on the road. A true sports coupe which is both aggressive and alluring—one of *Motor Trend's* top 3 cars of the year.



The Chevrolet Sportside Pickup. *Four Wheeler Magazine's* "Four Wheeler of the Year." The character of a work truck and the comfort and style of a passenger vehicle.



Concept car—the Chevrolet Venture. Its daring, all-glass upper structure automatically darkens, and a fun-to-drive 3.1L V-6 powertrain exudes the character of Chevrolet cars.

GMC TRUCK

Not just a truck anymore. A revolution in design and manufacturing has given birth to the finest trucks GMC has ever built.



"There would have to be a complete change in the old ways of building cars and trucks."



The all new Sierra by GMC Truck. A full-size pickup with aerodynamic styling, outstanding ride-and-handling characteristics, comfort and convenience. All with GMC Truck's traditional rugged durability.



The S-15 Jimmy. A powerful 4.3L engine, which will be available in the Jimmy early this spring, provides outstanding performance, towing capability and fuel economy.



Concept truck—the GMC Centaur. 4-wheel drive and 4-wheel steering. Automotive styling and the workhorse utility of a pickup truck in a single vehicle.

The cars and trucks you have just seen are evidence of GM's commitment to teamwork and technology.

Teamwork. We're reshaping our entire organization, changing the way we work together. The lines between managers, engineers and assembly people are fading fast. We are taking more time to listen to our customers and to each other.

Technology. We've built new factories, refurbished dozens of old ones. We've brought in new expertise from our Hughes and EDS subsidiaries. Computers. Lasers. Robots.

The results are here today, as seen in the cars and trucks introduced to the automotive world at the Waldorf-Astoria in New York early this year. It was a progress report, featuring our new products with the quality our customers demand and the value they expect.

But there's more to come—and soon. An example: Saturn, a new General Motors car company dedicated to a "clean sheet" approach to designing, building and selling cars in America. The first Saturn car will be seen in 1990, but already the advantages of Saturn's unique approach to car-building are evident in the GM cars you see today.



The job is not yet finished—there's more to be done. But today, the people of GM can proudly say—the vision is paying off.



THE VISION IS PAYING OFF.

Chevrolet • Pontiac • Oldsmobile • Buick • Cadillac • GMC Truck



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yielded very pessimistic results. Radar cannot distinguish warheads from even the simplest decoys, and, as General Abrahamson testified to Congress, "passive discrimination [infrared or optical sensing] is not quite sufficient" to pick out the warheads from a cloud of decoys.

Following this major setback, the SDI Organization pursued a new concept—"interactive discrimination," using neutral-particle beams. This is why the SDI Organization gave McDonnell-Douglas the \$481 million contract to build a prototype beam. Unfortunately, even this new concept is unlikely to be very successful in quickly separating the warheads from a cloud of decoys, according to testimony by Robert Cooper and a recent study from the Massachusetts Institute of Technology. (And the SDI Organization recently canceled the contract.)

With the prospects for boost-phase and midcourse-phase intercept only marginal—using existing or near-term technology—we are left with the prospect of stopping more than 30,000 warheads when they are above the United States, only minutes from their targets. However, the Soviets may have taken steps—as we have—to thwart terminal defenses.

In March of 1987 Lawrence Woodruff, the deputy undersecretary of defense for strategic and theater nuclear forces, described the contest between the offense and the defense to the House Armed Services Committee this way:

The Soviets have been developing their Moscow [ABM] defenses for over ten years at a cost of billions of dollars. For much less expense we believe we can still penetrate these defenses with a small number of Minuteman missiles equipped with highly effective chaff and decoys. And if the Soviets should deploy more advanced or proliferated defenses, we have new penetration aids as counters under development. . . . We are developing a new maneuvering re-entry vehicle that could evade interceptor missiles. . . .

Woodruff is correct, and the implications of his statement for the President's astrodome vision are, to say the least, sobering: if the Soviets can't even defend one city, think how hard it would be to defend a nation.

The most effective way for the United States to guard against a sudden treaty-violating Soviet deployment of anti-ballistic-missile systems would be to increase our research efforts on decoys and improved penetrating warheads. These can defeat any known or anticipated Soviet land-based ABM system. Change the word "Soviet" in that sentence to "American," and you begin to see how relatively easily the offense can overwhelm the defense in nuclear warfare.

As if the hardware problems were not serious enough, most experts believe that the computer software to manage the entire battle would be even more difficult to develop. (See Jonathan Jacky, "The 'Star Wars' Defense Won't Compute," June, 1985, *Atlantic*.) It would be much more complicated than the software that runs the space shuttle, and yet it could never be tested in a realistic nuclear-attack

scenario; it would have to work the first time it was used. A recent report by the General Accounting Office has severely criticized the SDI Organization's "inadequate direction and planning" of the crucial battle-management program. After a year-long study, the GAO said, "The problems, if not corrected, could reduce [the SDI Organization's] ability to provide the needed information for an informed systems development decision planned for the early 1990s." Yet one of the directives that Weinberger dashed off before leaving the Department of Defense actually calls for reduced oversight of the SDI Organization by the Secretary of Defense.

The bottom line is not very encouraging. Louis Marquet, SDI's former deputy director for technology, admits that a near-term deployment of interceptors is "not going to have a lot of capability against a determined first strike. . . . ultimately, given a dedicated Soviet effort at countermeasures, it will run out of steam." The answer, he says, would be to improve the system by adding more and better orbiting battle stations and other weapons at additional expense.

Finally, Phase I or any later phase of SDI will have little potential for stopping any nuclear weapons other than ICBMs, with their high ballistic trajectory. As a nation that has very limited air-defense capabilities, we should recognize the relative ease with which our defenses can be penetrated by low-trajectory submarine-launched ballistic missiles, Soviet bombers, and air-launched and sea-launched cruise missiles. According to the Library of Congress, by the end of the century the Soviet Union could triple its inventory of submarine-launched-ballistic-missile warheads from 3,400 to 13,000 and vastly increase its bomber-warhead inventory, from 800 to 7,500. The Soviets are already reported to be building a new type of submarine-launched cruise missile, the SS-NX-24, which could defeat SDI by penetrating U.S. airspace at a low altitude.

The conclusion is inescapable: There is no convincing evidence that the result of premature deployment would likely be anything other than a defense-offense-defense cycle weighted in the offense's favor. Because of technical limitations inherent to the proposed SDS, the result of deploying it would likely be to send the arms race spiraling in time and space.

Dr. Robert Sproull, a member of the SDI Advisory Committee, warned Congress that the SDI Organization "tries to keep the discussion on technical details." He said, "They go straight from the President's vision to specifics of engineering. They avoid the questions of survivability and cost."

There is some evidence for this charge. The Defense Authorization Acts for fiscal years 1986 and 1987 required the Defense Department to submit estimates of the cost for research, development, and procurement of anticipated SDI systems to Congress along with the 1989 budget request. In March of last year General Abrahamson explained, "We did not submit a report with the FY 1988-89 budget request because the information necessary to

prepare an accurate, comprehensive report is simply not available."

Yet the previous January, SDI's deputy director for technology, Louis Marquet, had said that it would cost "on the order of \$100 billion" merely to reach the starting line for production of an early-deployment system. In June, General Abrahamson submitted detailed cost estimates to the Defense Acquisition Board. And several independent cost estimates have been prepared, including a study by the Senate which suggests that it could cost as much as \$1 trillion simply to *launch* an SDI system into space, not including the cost of the satellites themselves. If scientists and senators can calculate possible costs with considerably fewer resources than the SDI office has, and top Department of Defense officials can come before Congress and testify with dead certainty that comprehensive strategic defenses are feasible and can be deployed within a given time frame, then these officials should be forthcoming with detailed estimates of how much the deployment will cost the taxpayer.

Crash Program

IN LIGHT OF THE SUBSTANTIAL TECHNICAL, MILITARY, and economic problems confronting SDI, to say nothing of the nearly universal skepticism from the nation's scientific community, it may be asked, How can President Reagan support so dubious a program? Further, how can it have advanced so far, consuming \$13 billion over the past five years, and now be rushing toward deployment?

The President is a man of tremendous communication abilities, and his efforts are aided by the simplicity of his goal and the exquisite perfection he anticipates. His closest advisers on SDI have been figures like Edward Teller. A famous scientist but a man who has obviously spoken inaccurately about the problems confronting SDI, Teller is highly motivated by his desire to assure the realization of his dream. In addition to the personal, political, and ideological forces driving SDI, there has sprung up a group of defense contractors whose officers and stockholders could greatly benefit from the majestic proportions of the envisioned project. There is also a bizarre combination of idealists seeking an easy way to rid the world of war and hawks who never saw a weapon they didn't like or a war they wouldn't want to fight. Finally, there is the growing SDI bureaucracy, which now consists of 225 full-time and 300 part-time employees, in addition to thousands of scientists and engineers working on more than 3,000 SDI contracts across the country. Together these people and these forces have advanced a juggernaut of such technical complexity and with such strong presidential support as to be capable of intimidating any sensible majority. It is time to step back from the brink and restore reason to this program.

There is no pressing national-security interest that compels a crash program to deploy SDI. The Scowcroft Commission officially closed the so-called window of vulner-

ability in 1983, when it determined that the chance of a successful Soviet first strike was very remote. If the purpose of SDI is now to "strengthen deterrence by denying the Soviets any confidence in a successful first strike," as Weinberger said last August, we are already spending over \$35 billion annually on other strategic-forces programs to do just that.

The two thirds of our ballistic-missile submarine fleet normally kept at sea, the one third of our bomber force normally kept on strip-alert, and the tremendous uncertainties involved in attacking our ICBM forces supply credible deterrence that will be sufficient for the rest of the century. Improvements that are under way on all legs of the U.S. strategic triad and on the U.S. command-and-control system should increase our confidence: new motors, warheads, and penetration aids for the Minuteman; fifty MX missiles; possibly Midgetman mobile missiles; Ohio-class nuclear submarines; Trident II sea-launched ballistic missiles; ground-, sea-, and air-launched cruise missiles, advanced "stealth" cruise missiles; and the deployment of 100 B-1 bombers, with Stealth bombers to follow. The U.S. troops and their families stationed in Europe serve as a credible link between the United States and the defense of NATO. There is no firm evidence that a limited ballistic-missile defense to "complicate Soviet attack plans" is anything other than unnecessary.

Further, recent experience demonstrates that there are grave dangers in crash programs. The House Armed Services Committee last year investigated the B-1 bomber and the MX missile—two key strategic programs that were pushed through by this Administration without adequate thought or testing.

As it turns out, we will have 100 B-1s that cannot penetrate Soviet airspace because, among other defects, when their advanced electronic systems are switched on, the defensive systems interfere with the offensive systems, and both act as a giant beacon guiding enemy missiles to the planes. It will cost at least \$6 billion to fix the planes, over and above the \$28 billion already spent. Meanwhile, the MX is still not survivable and, worse, its high-technology guidance units do not work as promised. At least twelve of the thirty deployed MXs cannot be fired for lack of these units, and the rest can't be counted on to hit their targets, because of shoddy workmanship. A Northrop Corporation engineer who worked on the guidance equipment testified that it is "most assuredly defective." As a result, he said, "these missiles stand as much chance of hitting their targets in the Soviet Union as landing right here in Washington." Basic tests are still being conducted on the B-1 and the MX, years after the first weapons were delivered.

These programs were pushed through Congress by a skillful distribution of defense contracts. Rockwell Corporation, for example, farmed out work on the B-1 to some 5,200 subcontractors, until there was a contract in almost every congressional district. The same was true for the

MX. If SDI can reach that level of spending, it may be impossible to stop. We do not need another crash program fueled by contractors' hunger for profits and bureaucrats' concern about their careers. In January of last year Allan Mense, then the SDI program's acting chief scientist, said, "If we don't come up with something specific, people are not going to let us play in the sandbox for ten years." But there *is* strong support in Congress and among the American people for a sound basic-research program.

What should we do? First, we should commit to a careful, long-term research program on ballistic-missile defense—not the program as it is now structured but one that would allow us vigorously to explore advanced technologies to see if someday we can achieve the President's vision of an impenetrable shield, as unlikely as that may be. Since the Soviets have an SDI program themselves, the better part of wisdom is for us to maintain our lead in strategic-defense technologies and avoid the possibility of their developing something really effective while we are left lagging behind. Expert testimony to Congress, including that of Sproull, Cooper, and the physicist Peter Zimmerman, indicates that a robust research program can be carried out for about \$3 billion a year. (The Administration wants to spend more than \$5 billion in 1989.)

Second, we should explore the possibility of deploying a defense similar to the one the Soviet Union now has around Moscow, which might protect us against an accidental ICBM launch. The ERIS program, which is part of SDS, could possibly serve this function. Lockheed Corporation is lobbying hard to accelerate the ERIS schedule for a 1990s deployment regardless of the fate of the rest of SDI. Lockheed estimates that the total cost would be about \$5 billion for a system of 100 ground-launched interceptors and radars, which might be in compliance with the existing ABM treaty. If feasible, ERIS would be an expensive insurance policy, but we should investigate this option. It may be a reasonable hedge against an accidental Soviet launch of a single ICBM headed for New York or Washington, and it could give us hands-on experience with ballistic-missile defense. The widely mentioned notion that

such a system could defend the United States against terrorist attack seems dubious, given how unlikely it is that terrorists would use a ballistic missile; they are much more likely to deliver their bombs in a suitcase or on a fishing trawler. These are hardly the only conceivable alternative delivery systems. A witness before the Senate Armed Services Committee recently noted that "the Soviets could just put nuclear weapons inside bales of marijuana, since they know we can't prevent that from entering the country."

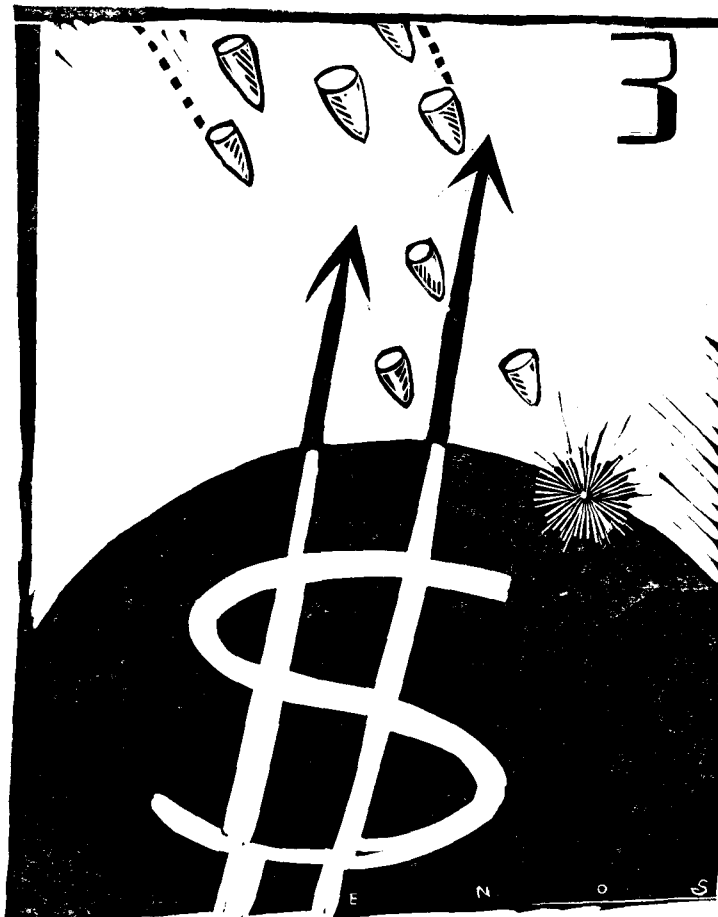
Third, we should use the SDI program as leverage to

negotiate a treaty with the Soviets under which both countries would eschew space weapons and further agree to substantial and fair reductions in offensive weapons. This may prove to be the most valuable contribution of the SDI program. Such a treaty would be mutually beneficial, verifiable, and enforceable. The benefits are obvious, and we have the means to verify an agreement through existing spy satellites and the new willingness of the Soviets to allow on-site inspections. We should test the Soviets on their stated offer to arrange inspections of all satellites before launch. Such inspections could ensure that space weapons were not placed in orbit surreptitiously. We could enforce such a treaty by including a provi-

sion that allowed the inspection of satellites suspected of violating the ban. The inspection could perhaps be accomplished with the space shuttle.

Independent experts, retired and active-duty military spokesmen, members of Congress, and congressional staff have raised questions indicating that serious technical, legal, and military issues pertaining to SDI remain unresolved. As the Army Chief of Staff, General John A. Wickham, Jr., told Congress early last year, "We are all in agreement that we don't know enough to make a deployment decision."

Defending our population from incoming missiles is an admirable goal. But in trying to achieve that goal we must not let the political-industrial complex produce weapons that not only are ineffective but also increase the chance for ever more lethal offensive escalations. □



Stephen Appelbaum likes asking passers-by to peruse his stock, which includes Mr. Gross Mouth and a skeleton named Fred, and then having them guess what he does for a living

THE EVIDENCE STORE

BY DAVID OWEN

THE CUSTOMER WAS LOOKING FOR SOMETHING IN A herniated disk. He wanted some inflammation—but not too much inflammation—and some agonizing pressure on the spinal cord. You know the kind of agonizing pressure I mean? Down in the lumbar region? He wanted it right away.

Fortunately, Stephen Appelbaum had just the thing. He carries a full line of herniated disks, some with complete prolapses and some without. His deluxe model, which costs \$75, was exactly what the customer was looking for. It comes with two vertebrae, three interchangeable disks in different stages of deterioration, and a viewing stand. The customer took it with him.

Appelbaum is the proprietor of The Evidence Store, in Union, New Jersey, just west of Newark International Airport. He likes to describe his business as “the only full-service walk-in retail store for trial lawyers” and “Toys R Us for attorneys.” He sells and rents not only detailed plastic models of herniated disks (his most popular item) but also models of pelvises, legs, jaws, hearts, knees, eyes (two sizes), spines, wrists, shoulders (from five different manufacturers), hands, brains, and other body parts. Lawyers use the models to create compelling courtroom exhibits in personal-injury lawsuits.

Appelbaum also sells a lot of other things, including a full-color poster called “Normal female abdominal anatomy post CO₂ gas insufflation,” scale models of traffic accidents, coffee cups covered with humorous sayings about the legal profession, The People’s Court board game, a set of false teeth called Mr. Gross Mouth (which has fake gum disease and spits real tobacco juice), bumper stickers that say MY LAWYER CAN BEAT UP YOUR LAWYER (these are free), and a diagram illustrating that standby of the personal-injury trade, “whiplash cervical misalignment.”

A typical Evidence Store customer is a lawyer from Newark whose attempt to settle his client’s \$20 million medical-malpractice suit for \$40,000 has just collapsed. He now finds himself going to trial with nothing to show the jury. So he calls Appelbaum or, as often happens, drops in to browse. If he has a carpal-tunnel-syndrome case, Appelbaum may sell him a model of a wrist that a surgeon can dissect in front of the jury. If he’s representing a woman who fell off a barstool and hit her head on a cigarette machine, Appelbaum may rent him a halo traction brace with a padded plastic jacket, so the jury can get an idea of what it’s like to have a broken neck. If the lawyer plans to intro-

duce an x-ray as evidence, Appelbaum may suggest making a dramatic enlargement. One such enlargement, depicting the bones in someone’s leg, is tacked to a door in The Evidence Store. The bones are held together by eight screws and a metal plate. Written in black ink at the top of the picture is “\$350,000!!!”

Every now and then a curious non-lawyer will spot Appelbaum’s sign and wander in to find out what a store called The Evidence Store could possibly sell. Appelbaum likes to kid around with these people. He tells them, “Figure out what we do and win a prize.” They look at the skinless leg model. They look at the sign that says YOUR SPINAL CORD INJURY . . . WHAT HAPPENS TO BLADDER AND BOWEL CONTROL? They look at the x-ray of a bullet lodged in a spine. They look at the mildly pornographic light-switch plates (popular with legal secretaries, who often shop for their bosses). Then they give up.



STEPHEN APPELBAUM DIDN'T GROW UP WANTING TO sell copies of *The Slip and Fall Handbook* to lawyers in eastern New Jersey. In fact, in the early 1960s, as a grumpy teenager attending summer camp in Nyack, New York, he didn't want to do anything at all. He didn't like sports. He didn't like outdoor activities of any kind. His exasperated counselor—the novelist Chaim Potok, incidentally—suggested that he take up photography. This he did with a vengeance, returning to camp the following summer with his own portable darkroom, which he set up in his bunk.

After earning a degree in photographic illustration at the Rochester Institute of Technology, Appelbaum held a number of jobs that involved either taking pictures or selling cameras. Nothing captured his imagination, though, until his cousin, an insurance-claims adjuster, called him one day and asked if he'd like to photograph some fire damage. Appelbaum found that he enjoyed photographing fire damage. In time he branched out into traffic accidents.

Soon Appelbaum was receiving inquiries from lawyers who had seen his fire-damage and traffic-accident pictures in courtrooms and wanted him to photograph bungled face-lifts and slippery floors. His business grew. In addition to taking pictures, he began blowing up x-rays and medical charts. Then he began selling easels to hold the enlargements. Then he began selling cases to hold the enlargements and the easels. Then he heard from a friend who had just opened a skeleton-rental service in Atlanta.

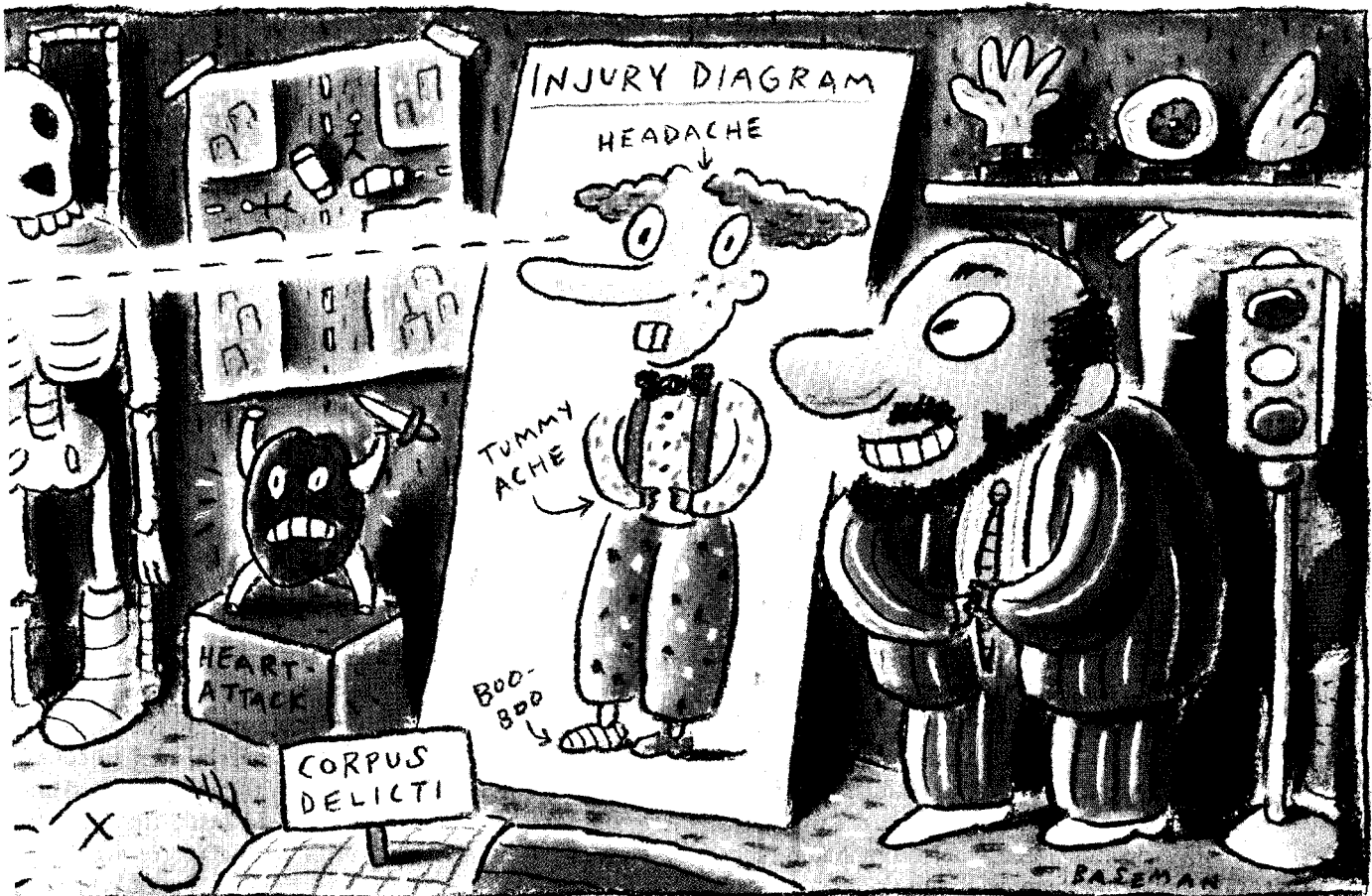
A pretty nutty idea, renting skeletons—but didn't lawyers sometimes need skeletons? He bought a full-sized plastic skeleton and named it Fred.

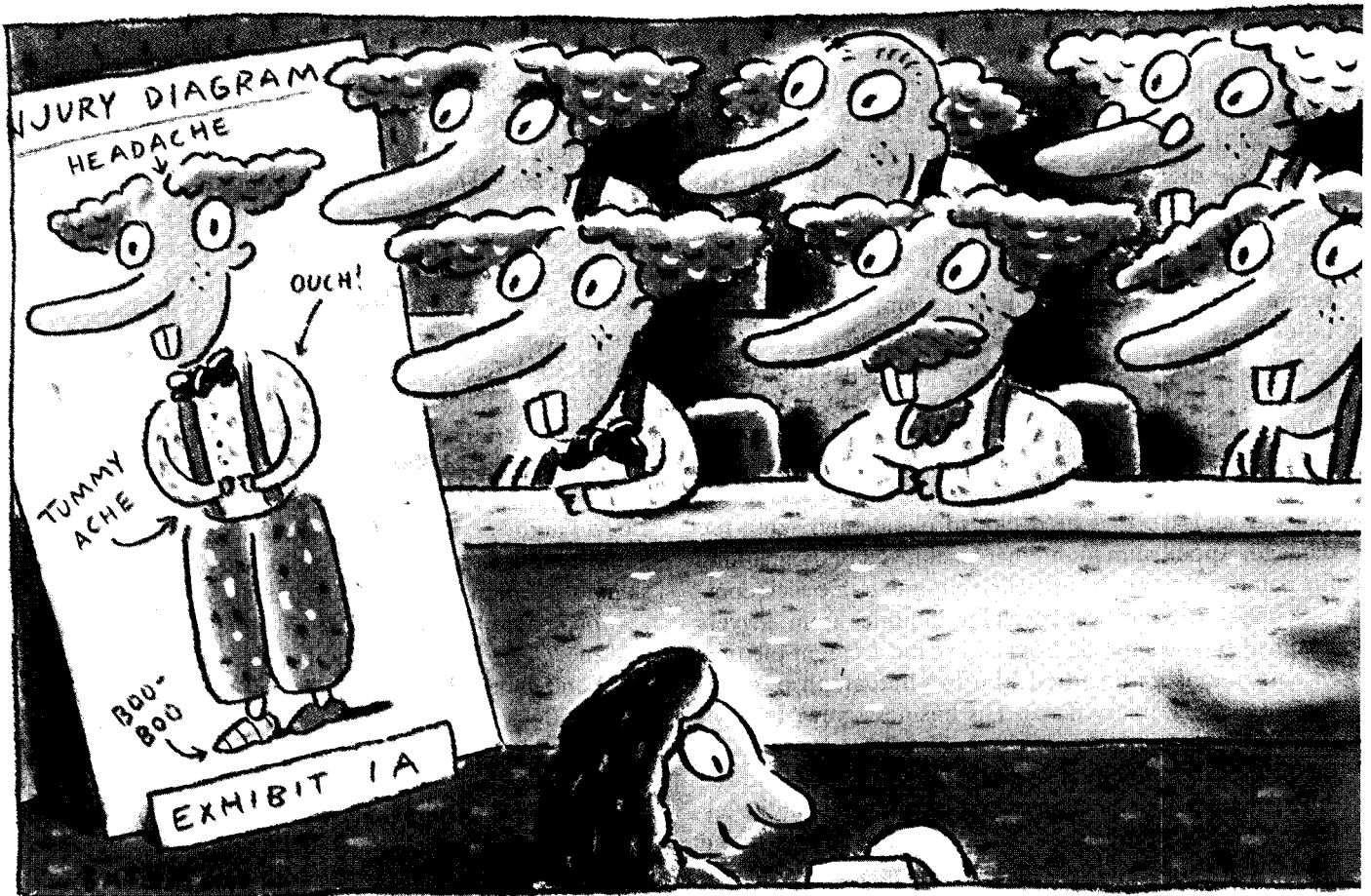
Except when he's rented out, Fred still stands in a prominent place inside The Evidence Store. When I visited, not long ago, Fred was smoking a pipe and wearing a leather cap, sunglasses, a skeleton necklace, and a red T-shirt that said I'M FRED. . . . TAKE ME TO COURT. Beside him was another skeleton, also for rent. Two days before, Appelbaum had sold a deluxe skeleton (all the bones numbered, muscle origins painted in red and blue) for just under \$1,300. The skeletons are shipped in big cardboard boxes that look like coffins.

Taking pictures of other people's misfortunes is still a key source of income for Appelbaum and his three assistants. (Their photographic business is called Garden State Legal Photo Service.) Appelbaum does much of his photographic work in a cluttered studio that adjoins, and occasionally overflows into, The Evidence Store.

"You should have been here a couple of weeks ago," he told me. "I had one guy who had been beaten up by the cops, and another guy who had what they call an external fixation device. All his bones were being held together from the outside, with all these pins going through his leg. So he's sitting here, and over there is some other guy with crutches and lacerations and scabs. It looked like a hospital waiting room. Next!"

On the day I paid my visit, a well-dressed man dropped





by to look at some photographs that Appelbaum had taken of his face, which had a scar on it. The man had filed a lawsuit concerning this scar, and his lawyer wanted the photographs as evidence. While the man looked at the pictures, Appelbaum made small talk.

"I just heard of a case where a guy got twenty-two thousand five hundred dollars for extensive facial injuries," he said cheerfully.

The man looked up. "Twenty-two five?" He sounded surprised and disappointed. Twenty-two million five hundred thousand would be more like it, said the tone of his voice.

Well, even if he doesn't win anything, the man will still have those pictures. Appelbaum told me later that this was the second time he had dropped by to look at them.

"I'VE GOT A BIG PROBLEM," APPELBAUM TOLD ME. "I happen to enjoy what I do." Appelbaum is thirty-nine years old. He is of medium height and has short dark hair. His hairline has traveled so far north that it is on the verge of moving south again. He has a beard. He likes to eat and, over the years, has put some distance between his own skeleton and his clothes, which are nice. Lately he has been trying to make his male assistants understand the importance of wearing neckties at work, but they hate wearing neckties, and when Appelbaum looks the other way, they hang them over various doorknobs.

One thing Appelbaum particularly enjoys about his work is the occasional opportunity it gives him to emulate his hero, Paul Drake. You remember Paul Drake—the private detective who works with Perry Mason. Paul Drake is always rushing into the courtroom just before the end of the show. Perry Mason says, "May I have a moment, Your Honor?" Then Paul Drake whispers something into his ear and hands him a little piece of paper. Perry Mason steps up to the witness stand and reads from the little piece of paper. When the witness hears whatever is written on the paper, he falls into a fit of lunatic sobbing and blurts out a detailed confession of the crime.

Of course, everyone knows that the legal process doesn't really work like that. Most cases don't even get to court, or if they do, they tend not to stay there very long. My wife once served on a jury in a case that ended in a plea bargain after the defense attorney inadvertently referred to his client, in front of the jury, as "Mr. Guilty." Next!

Still, trials happen, and Appelbaum occasionally gets to live out his fantasy. Once he was hired by a lawyer who was representing someone whose car had been hit head-on at ninety miles an hour by a car that was being chased by a police car. Appelbaum's job was to re-create the chase on movie film. He did this and brought the film to court. Then he spent about two hours on the witness stand answering questions about how he had made the film (by mounting a camera in a car and shooting a forty-five-mile-an-hour chase at half the normal camera speed). When he



finished, the judge ruled that the film, though it involved trick photography of a sort, was admissible as evidence. On hearing this decision, the other side offered to settle the case.

Another case that Appelbaum worked on involved a young man who had been arrested while sitting in his Corvette on a street in New York. Appelbaum was hired by the young man's attorney, who hoped to prove that the police couldn't possibly have seen what they said they had seen before they arrested him: a gun sitting in plain view on the passenger seat. A Corvette's seats are very deep—like real buckets. Appelbaum took some pictures and brought them to court.

In the course of the trial some new point came up that hadn't been mentioned in the original testimony or documented by the photographs. Appelbaum put down his newspaper and tapped the young man's lawyer on the shoulder. "If you'd like," he said, "I could try to get some more pictures before this afternoon." The lawyer said to go ahead and try.

It was noon in lower Manhattan. Appelbaum's office is all the way over on the other side of the Hudson River. He called his assistants and said, "Find me a Corvette." Then he took off for the Holland Tunnel. While Appelbaum was racing back to New Jersey, his assistants frantically tried to track down a Corvette of the proper year and model. They called Chevrolet dealers. They called used-car lots. They called mechanics. No luck.

Appelbaum by now was almost back to Union. Suddenly, up ahead, he saw precisely the kind of Corvette he was looking for. He turned on his headlights, flashed the high beams, and blew his horn. "The guy pulled over. I was surprised." Appelbaum told the driver he could have anything he wanted if he would just let Appelbaum take a few pictures of his car. The guy said that would be okay.

It wasn't until after he had finished that Appelbaum got around to explaining why he needed the pictures. "So I explained, and the guy said, 'Hey, I can *prove* that you can't see a gun on the seat of a Corvette.' I said, 'How can you do that?' And he said, 'I've got a gun in the car.' So we took a few more pictures." Appelbaum then drove to his office, processed the film, printed it wet, and raced back to Manhattan. He got to the courtroom just as the afternoon session was beginning. Total elapsed time: an hour and forty-five minutes.

"So what happened?" I asked him.

"Well, some dummy came up with the bright idea of bringing an actual Corvette to the courthouse and having everybody go down and see for themselves," he said. "The case did not go well for that kid."

YOU CAN NEVER TELL HOW THINGS ARE GOING TO GO at The Evidence Store. Some days are slow. On slow days Appelbaum's assistants tend to spend a lot of time going out for coffee and forgetting to remind Appelbaum to pick up his nine-year-old daughter, Carly, at school. But other days are filled with action. Recently Appelbaum had to go out and crawl around in some muddy, rat-infested tunnels under the foundation of a new building. The ground under the foundation had been sinking. Appelbaum's job was to take pictures of broken pipes and electrical connections. ("I felt like I was escaping from Nazi Germany. With camera equipment.") Over the weekend he had taken pictures at a lake where someone had dived off the end of a dock into two feet of water and become a quadriplegic.

While Appelbaum was telling me about these and other assignments, the telephone rang. It was a lawyer who was representing a hospital that was being sued by a woman who had broken her hip while doing volunteer work in the hospital's chapel. The lawyer wanted Appelbaum to take pictures of the chapel.

Appelbaum loaded some camera equipment into the trunk of his car, a three-year-old Mercury Cougar with a hundred thousand miles on it, and we drove to the hospital. Stuck to the Cougar's sun visor was a lapel button that said I LOVE LAWYERS. The ornament on Appelbaum's key chain was a little plastic spine. We passed a flagman who was guiding traffic around a road-repair crew.

"I do a lot of cases where a guy like that will get hit by a car," Appelbaum said, nodding toward the flagman. "They can't sue their employer, because of workman's comp, so they'll try to find somebody else." During the twenty minutes or so it took us to get to the hospital, we

drove past what struck me as an unusually large number of traffic accidents. "I used to stop for serious accidents, but for the most part you're just eating up film." Still, he keeps a carefully cross-referenced photo file of dangerous roads and intersections. (Accidents tend to happen repeatedly at the same places.) The best times to photograph busy streets are Thanksgiving morning, Christmas morning, and Easter morning, because there's so little traffic.

The hospital chapel was small and pleasant. There was a modernistic pulpit in the front—really just a lectern. It stood on a broad, carpeted platform. One ascended to this platform by climbing a broad, carpeted step. Six inches up to the step, then six more inches up to the platform. This was where the accident had taken place. While Appelbaum was walking around checking readings on his light meter, I pretended to stumble on the step. A funny joke!

Shortly after we arrived, a nun came in and knelt in one of the pews. I assumed that she was praying for our early departure from the chapel, but it turned out that she was praying for the early and favorable resolution of the lawsuit. It was she who had supervised the litigious volunteer. "All I said to do was dust the tabernacle," she told me. Instead the volunteer had attempted to dust a sconce. It was while doing this that the volunteer had fallen. According to the nun, the lawsuit accused the hospital of failing to train the volunteer sufficiently before permitting her to ascend the carpeted step.

Appelbaum used up three rolls of film, shooting the scene of the accident from dozens of angles. I held an auxiliary flash for him during some of the shots. The auxiliary flash wasn't connected to his camera by any sort of wire. It was triggered by a photoelectric sensor that picked up the burst of light from the other flash. (Some people might think there would be a noticeable delay between the two flashes. If you are one of these people, I suggest that you go to your local library and see what the encyclopedia has to say about the speed of light.)

ON OUR WAY BACK TO UNION, APPELBAUM GOT A CALL on his car phone from one of his assistants. The assistant said to drop by a certain law firm in Newark and meet with one of the lawyers. We did this. The lawyer wanted Appelbaum to make a big chart of some kind. (I had to wait out with the secretaries while they were discussing it.) He said he needed it right away. There are well-known legal-graphics firms that make the kind of chart he was looking for, but they don't work on such short notice. Appelbaum said he could do the job, and we left.

Appelbaum doesn't think much of the dramatic instincts of most lawyers. In preparing a case, he believes, your typical lawyer will spend many months piling up and poring over thousands of documents and deposing dozens of

witnesses. The photocopying bill alone would be enough to put many people in the poorhouse. When the case comes to trial, the lawyer will scrutinize potential jurors and attempt scientifically to weed out those who might have a predilection for not awarding millions of dollars to people who stumble or get stumbled upon. Then, with all the pieces finally in place, the lawyer will use the months of careful preparation and the mountain of photocopied documents to put the scientifically selected jury to sleep.

"The law by tradition is a profession of words and abstract ideas," Appelbaum told me. "It's not visually oriented, and lawyers aren't trained in law school to work in the courtroom."

Appelbaum tries to teach lawyers what law school didn't. If the case hinges on a few crucial documents, he may suggest copying them and placing the copies in attractive binders, so that the jury can follow along. (The ideal number of binders, according to Appelbaum, is half the number of jurors; sharing helps people stay awake.) If the case involves crippling injuries, he may suggest making a day-in-the-life video tape to show how much trouble the plaintiff has tying his shoes and combing his hair. (The ideal length of a day-in-the-life video tape, according to Appelbaum, is twenty minutes—roughly the length of a half-hour television show minus the commercials.)

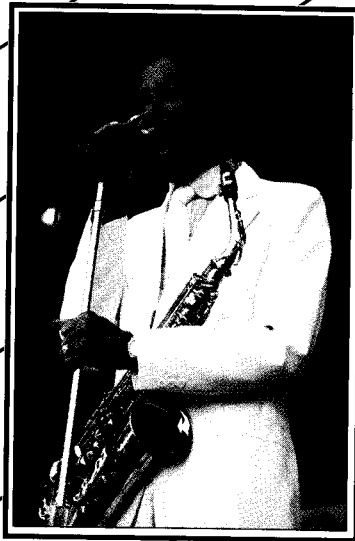
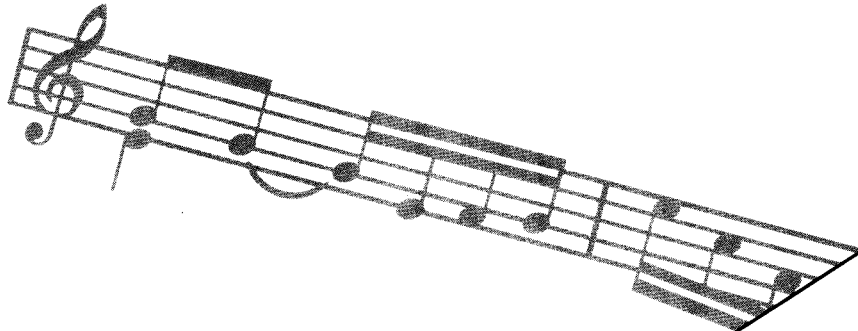
Walking into a courtroom and seeing a movie projector, Appelbaum told me, produces in a juror a feeling of elation that should be familiar to anyone who ever attended school. Yet few lawyers take advantage of this powerful human emotion. Some seem to forget about the jury altogether. One reason companies lose big lawsuits, according to a recent article in *The New York Times*, is that they are "represented by obnoxious counsel."

Of course, a system of justice that turns on whatever it is that gives Tolstoy a smaller following than *The Brady Bunch* may be nothing to celebrate. The same could be said of our habit of paying people millions of dollars for not knowing how to use a ladder. But if you, like me, enjoy criticizing lawyers, you won't hesitate to find fault with their tendency to be less interesting than television.

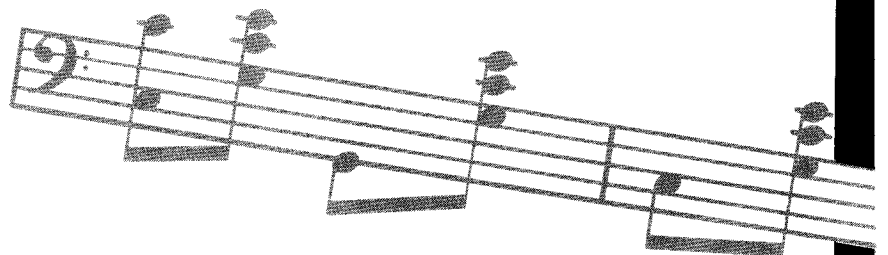
Appelbaum is trying to help. He has invented a magnetic display board, called the Mini-Map, that lawyers, police officers, and others can use to reconstruct traffic accidents. The Mini-Map, which sells for \$100 (including magnetic cars, marking pens, a drawing template, and a carrying case), was recently featured in the new-products section of the *Cincinnati Court Index*.

Even better, several people have approached Appelbaum about franchising The Evidence Store nationwide. Soon you may not have to go all the way to Union, New Jersey, to rent a leg. Trials could eventually become so interesting that people might refuse to settle out of court, simply for fear of missing the movie. □

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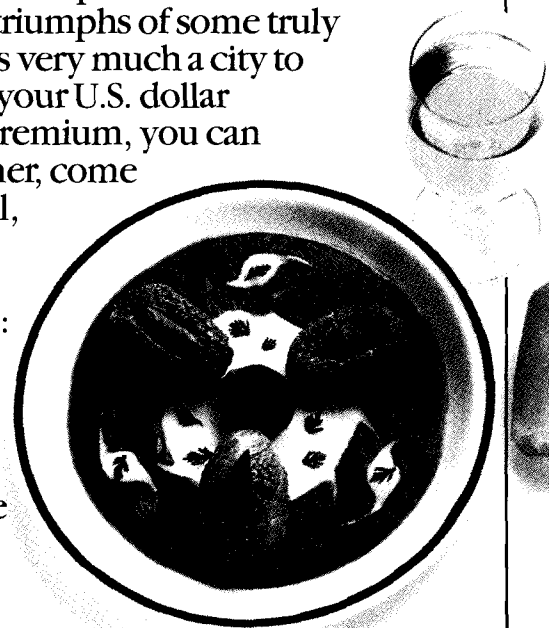


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The World Next Door

Herewith the special events—critically acclaimed music and arts festivals, important anniversaries, world-championship sports—that you will be reading about elsewhere in the months to come. Also, this issue of the Travel Planner introduces ideas for vacations that incorporate some of the foreign events.

National, state, and provincial tourist boards have been our first resource in compiling the listings in this guide. In most cases these agencies stand ready to inform you about package tours, to explain procedures for reserving tickets where it is necessary to do so, and to provide innumerable other kinds of help.

Some of the listings reflect preliminary information, so do confirm dates and programs before making final plans. Also, for many of the events, tickets or hotel accommodations or both are expected to sell out early, so do plan ahead.

Barbara Wallraff

The Atlantic SUMMER TRAVEL PLANNER

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Joe O'Connell

The Atlantic
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New York, New York 10022
(212) 326-5350

For information about or additional copies of the Summer Travel Planner, telephone Ann Wallace at (212) 326-5350.

WE EXTEND SPECIAL THANKS for their help to Mark Bahti of Bahti Indian Arts, the Balloon Federation of America, the European Association of Music Festivals, Sylviane Gold, Eli Newberger of the New Black Eagle Jazz Band, Lucie Prinz, Stephen Schiff, Lloyd Schwartz, the Southern Ocean Racing Conference, The Athletics Congress, the Union Internationale de la Marionnette—U.S.A., the U.S. Golf Association, the U.S. Cycling Federation, the U.S. Tennis Association, and the U.S. Yacht Racing Union.

Thanks also, for the photographs used in the Travel Planner, to the Austrian National Tourist Office, Brent Olson for Innerasia Expeditions, Edelman Public Relations and the Stratford Festival of Ontario, the St. Lucia Tourist Board, the Festival of Arts of Laguna Beach, and Jacob's Pillow Dance Festival.

COVER: Photo collage by Cristina Botta. Photos courtesy of the Danish Tourist Board and the Monterey Jazz Festival. Music from "The Strenuous Life," by Scott Joplin.

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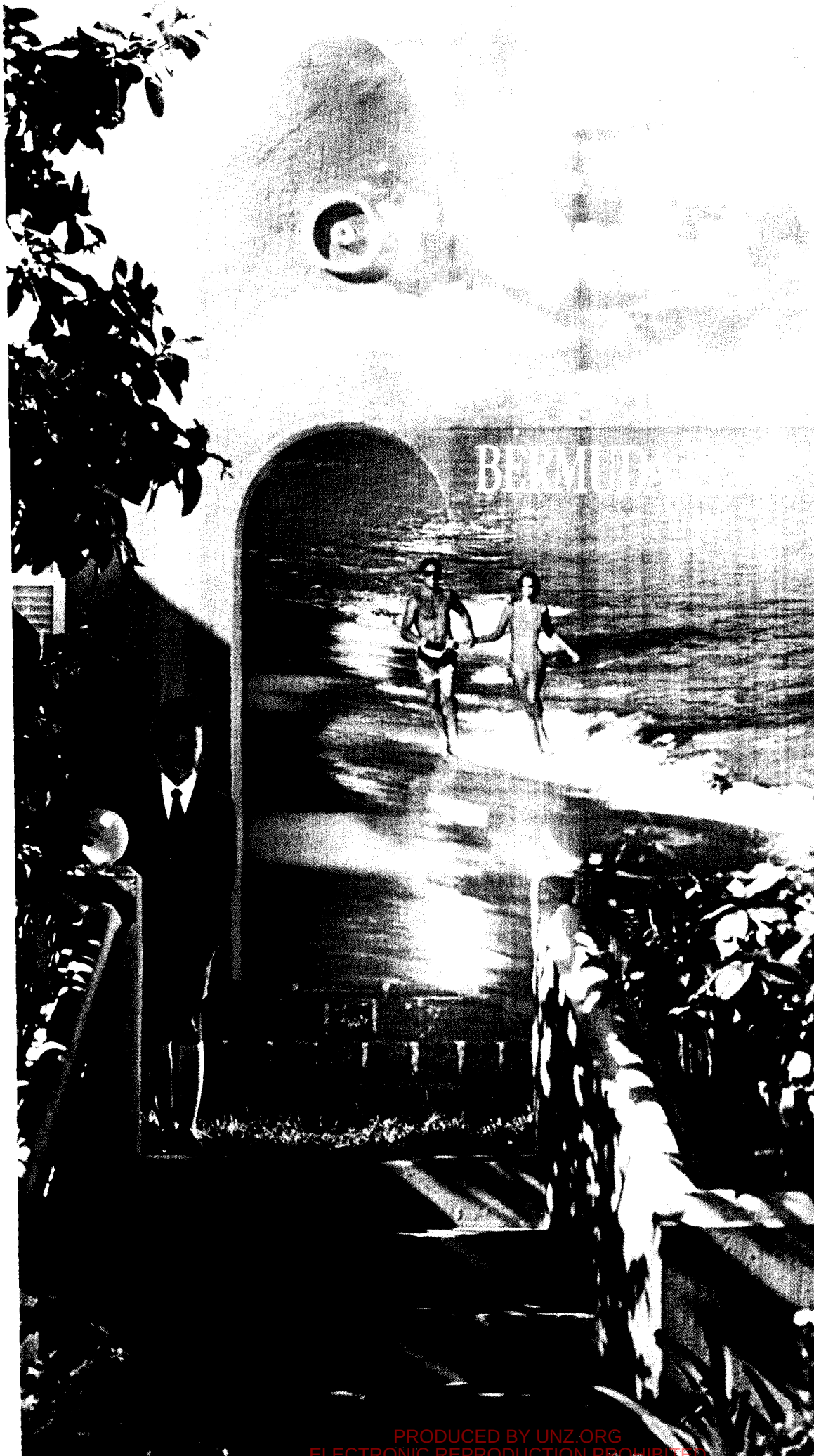
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THE TOWER OF LONDON SHOULD STAND FOR ANOTHER THOUSAND YEARS. UNLESS THE RAVENS DECIDE TO LEAVE.

As he lay dying—felled by a poisoned arrow—King Bran the Blessed commanded that he be buried beneath White Hill (where the Tower of London now stands). He believed this act would ensure that England would never crumble.

The way John Wilmington, current ravenmaster of the tower, tells it, “Bran” is Welsh for raven. So ravens were brought there in the belief that they—like the mythical king—would protect the Commonwealth from attack.

Today, the ravens, like the Crown Jewels with which they share the Tower, are considered national treasures. They even hold rank in Her Majesty's Army.

Nearly all of London's attractions hold unexpected stories. Big Ben—the world's most recognized timepiece—is kept accurate with the help of two old pennies strategically placed on the pendulum. Scotland Yard, made famous by Sherlock Holmes, was built on the site of the Palace of Scottish kings.

Or browse through the Old Curiosity Shop. Built in 1567, this antique shop is an antique itself, and was the model for the Dickens novel.

PAN AM HOLIDAYS TO LONDON

Experience London's curiosities firsthand with Pan Am Holidays “London Center Stage” vacation—for just \$799 to \$949. It includes airfare, hotel with private bath for 6 nights, breakfasts and tickets to a current West End hit. And a half-day sightseeing tour so you can take in intriguing sights like the statue of Daniel Pulteney in Westminster Abbey.

Some say it turns a page of its stone book on moonlit nights.

The unexpected sights overflow into the countryside as well. So Pan Am Holidays created 18 British vacations. “The Best of England” is an 8-day independent vacation from \$999 to \$1199 including airfare, rooms with private bath, breakfasts, plus four dinners.

Begin in London, where you'll get a ticket to the theatre plus a sightseeing tour so you can investigate some traditional sights. With time left to see some not-so-traditional ones as well—

such as the Grenadier Pub on Wilton Row where the head barman always wears a white jacket so the ghost will feel at home.

“THE BEST OF ENGLAND”

Then take an escorted first-class motorcoach through the countryside. Explore Stratford, Bath, Oxford and other attractions. Including Stonehenge—where ancient stones are said to have been carried to England by giants. (Some Pan Am Holidays vacations even go as far as Scotland. So you can visit “Nessie.”)

Prices are per person when two travel together, and include airfare from New York, Boston or Philadelphia. Slightly higher from other Pan Am cities.

Free “Britain for all Seasons” and “Pan Am Holidays” brochures are available through the British Tourist Authority, Box 7740, Woodside, N.Y. 11377. For reservations, call a travel agent or Pan Am Holidays at 1-800-THE TOUR.

When you get to London, make it a point to visit the Tower. And don't forget to tip your hat to the ravens—Cedric, Charlie, Hugine and Katie. They're always there.



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EUROPE

AUSTRIA

MAY 7-JUNE 12, VIENNA FESTIVAL.

This year the festival is producing Schubert's opera *Fierrabras*, with Claudio Abbado's Chamber Orchestra of Europe. The Concertgebouw, the Berlin Philharmonic, and London's Royal Philharmonic will be among the festival's guest orchestras.

The Vienna Festival office (and the Salzburg Festival office, and the Bayreuth Festival office, in Germany, and a few others) will tell you that tickets to the major events are sold out. However, some are available from Dailey-Thorp Travel, an American tour operator, as part of deluxe music-tour packages. See "Vacations in Europe," on page T-12.

JULY 21-AUGUST 24, BREGENZ FESTIVAL. Again this year it will be Offenbach's *Tales of Hoffmann* performed on the "floating" stage on Lake Constance.

JULY 27-AUGUST 30, SALZBURG FESTIVAL. Including four Mozart operas, Rossini's *Cenerentola*, and Schoenberg's *Moses und Aron*; two ballets, on Shakespearean themes, by John Neumeier's Hamburg Ballet; and concerts by the Vienna Philharmonic, the London Symphony, the Berlin Philharmonic, and the Concertgebouw, among other orchestras.

For information: Austrian National Tourist Office, 500 Fifth Ave., New York, NY 10110. (212) 944-6880.

BELGIUM

JUNE-OCTOBER, FESTIVAL OF FLANDERS, Brussels-Leuven, Antwerp, Mechelen, and Ghent. Quite a parade of orchestras will be passing through in the fall: the Moscow Philharmonic, the Royal Philharmonic, the National Orchestra of France, the London Symphony, the Birmingham Symphony, the Concertgebouw, and the Staatskapelle Dresden, to name a few.

AUGUST 28, WORLD BICYCLING CHAMPIONSHIPS, Brussels.

For information: Belgian Tourist Office, 745 Fifth Ave., New York, NY 10151. (212) 758-8130.

CZECHOSLOVAKIA

MAY 12-JUNE 1, PRAGUE SPRING. The Concertgebouw, London's Royal Philharmonic, and various Eastern-bloc orchestras will be among the guests.

For information: Czechoslovak Travel & Hotel Corporation, 10 E. 40th St., New York, NY 10016. (212) 689-9720.



On the "floating" stage at Austria's Bregenz Festival

DENMARK

THROUGH DECEMBER, 1,000TH ANNIVERSARY OF ODENSE. The celebratory events will include the opening of a new railway museum on April 17, a tall-ships visit June 9-12 and visits by Viking-style ships throughout the summer, a music festival in the streets July 31-August 6, and an international competition on the town's Marcusen organs September 29-October 9.

MAY 2-12, DANISH BALLET AND OPERA FESTIVAL, Copenhagen. The first annual Hans Christian Andersen Ballet awards will be presented at a gala on May 7; Walter Cronkite will be there, as host of a PBS television special. The festival will otherwise consist of performances of seven ballets, including a new ballet by Ib Andersen, and *Ekvira Madigan*, newly choreographed by Robert North; and four operas, including new productions of Mussorgsky's *Boris Godunov* and Mozart's *Don Giovanni*.

AUGUST 2-6, TALL SHIPS VISIT, Copenhagen. The rousing conclusion to a month-long series of races and port visits in the Baltic by upwards of 80 ships, many of them naval training vessels. (The ships will have raced to Copenhagen from Mariehamn, Finland, where they will have been in port July 23-26.) The farewells will include a parade by the crews, and fireworks on the 5th.

For information: Danish Tourist Board, 655 Third Ave., New York, NY 10017, (212) 949-2333; or Scandinavian Airlines System Tour Events desk, (800) 221-2350.

FINLAND

JULY 2-31, SAVONLINNA OPERA FESTIVAL. The Beijing Opera will take over from the resident company for the final week of the festival. The company will perform Mandarin-language versions of Bizet's *Carmen* and Puccini's *Madame Butterfly*, in the courtyard of the medieval castle of Olavinlinna.

For information: Finnish Tourist Board, 655 Third Ave., New York, NY 10017, (212) 949-2333; or Scandinavian Airlines System Tour Events desk, (800) 221-2350.

FRANCE

MAY 23-JUNE 5, FRENCH OPEN TENNIS CHAMPIONSHIPS, Paris. At Stade Roland Garros, 128 men and 128 women will compete in a Grand Slam tournament.

JULY 4-24, TOUR DE FRANCE, Pontchateau to Paris. The renowned bicycle race will proceed, as ever, to the Champs Elysees.

JULY 10-20, GRANDE PARADE DU JAZZ, Nice. Among the world's largest jazz festivals. The program will be available in May or June.

JULY 10-31, FESTIVAL D'ART LYRIQUE, Aix-en-Provence. A grande dame among the zillions of French music festivals (the French tourist office produces a good brochure on them all), with new productions of

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For information: French Government Tourist Office, 610 Fifth Ave., New York, NY 10020. (212) 757-1125.

WEST GERMANY

THROUGH DECEMBER, EEC CAPITAL OF CULTURE, West Berlin. *Eclectic* is the word. Among the premieres in various disciplines will be a ballet commissioned from Merce Cunningham, on June 15; the Berlin Version of *Prometeo*, by Luigi Nono, for twelve soloists, a choir, an orchestra, and truckloads of expensive electronic equipment, on August 30; *The Forest*, a music, drama, and film work by Robert Wilson and David Byrne, on October 15; a work by Laurie Anderson, in mid-October; and the European Film Awards, henceforth to be given in a different European city each year, on November 26.

Classical music. One highlight will be the Brahms/Schoenberg Cycle, mid-September–November. Performances by the BBC Symphony, the Ensemble Intercontemporain, the Orchestre de Paris, the Berlin Philharmonic, and the Chamber Orchestra of Europe (under Gidon Kremer and Nikolaus Harnoncourt) will further the purpose of this event: comparing the work of the two composers. Another classical-music highlight will be the annual Berlin Festival, to be held August 30–October 2, including concerts by the Berlin Philharmonic (with guest conductors), the National Orchestra of France, and the Chamber Orchestra of Europe, among other orchestras.

Contemporary music and jazz: Concerts of improvised music, in which Cecil Taylor and various European improvisers will perform together in small and large groups, will be held June 15–July 10. Avant-garde, high-tech music events will take place August 12–14, outdoors; and October 15–23.

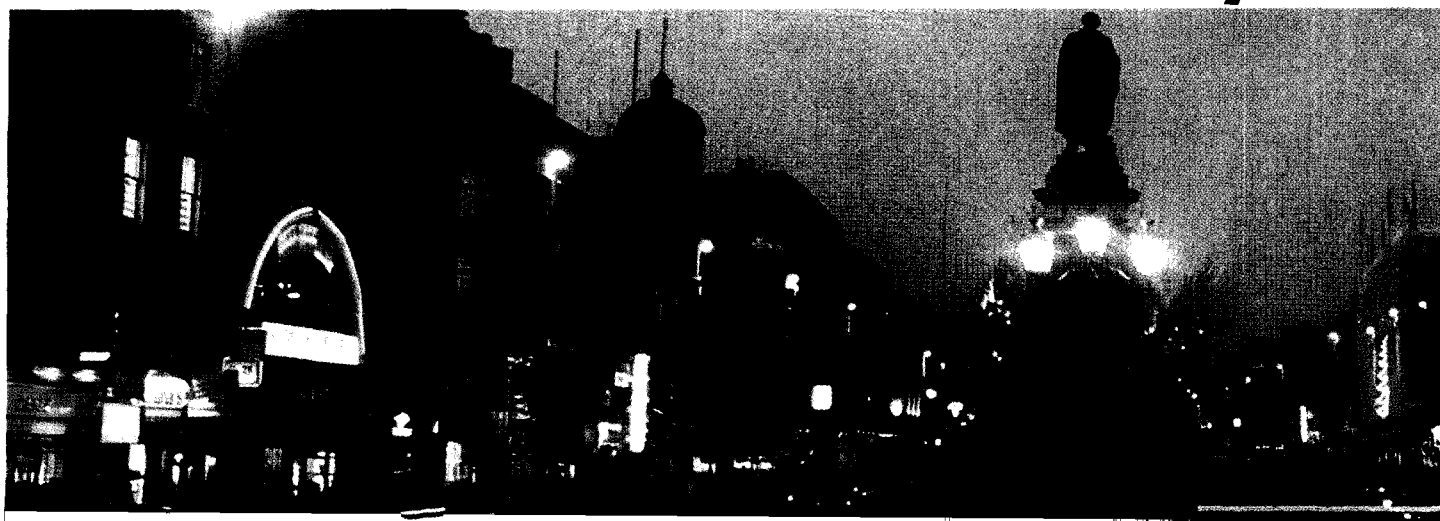
Art exhibits: Joint projects by sculptors from elsewhere in Europe and local sculptors will be on view in the city's public

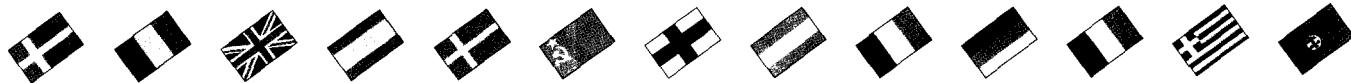
spaces through December. Major pieces from the era of Emperor Augustus, on loan from the Capitoline Museum and the Vatican, will be exhibited at the Martin Gropius Building June 6–August 14. "Positions of Present-Day Art," works by Mario Merz, Jannis Kounellis, Nam June Paik, Frank Stella, Richard Serra, and Anselm Kiefer, will be exhibited at the National Gallery June 23–September 30.

Exotica: At "The Party of Parties," April 28–May 3, parties typical of various periods over the past four decades will all be thrown at once, at the Kongresshalle. The English Shakespeare Company will perform all seven of Shakespeare's Royal Plays in a row, July 1–3. And "Inferno and Paradise," a sound-and-light spectacle to be presented August 19–21 and 26–28, is meant to transform about one and a half square miles of Wannsee Lake into a meditation on the theme of Dante's *Divine Comedy*.

JULY 4–31, MUNICH OPERA FESTIVAL. The festival will open with a new production of Richard Strauss's *Liebe der Danae* and

She's a thousand years has a remarkably ac





Europe

continue with all 14 other operas by Strauss (*Guntram* and *Friedenstag* in concert versions); one opera each by Janacek, Mozart, and Wagner; and two ballet programs (one of them including Strauss's *Josephs-Legende*). Is 1988 a Strauss centennial or the like? Thank goodness, no. Wolfgang Sawallisch, the festival's guiding spirit, just felt like doing a Strauss series.

JULY 26–AUGUST 29, BAYREUTH FESTIVAL. A new staging of Wagner's *Ring* cycle, for which Daniel Barenboim will serve as music director, is being presented this year.

SEPTEMBER 24–OCTOBER 1, WORLD GAS BALLOON CHAMPIONSHIP. Gersthofen. Starting from the Freiballonverein Augsburg field, about 40 miles from Munich, 18 hydrogen balloons will battle it out in a series of races. No smoking, please.

For information: German National Tourist Office, 747 Third Ave., New York, NY 10017. (212) 308-3300.

GREECE

APRIL–MAY, DAEDALUS FLIGHT, Heraklion to Santorini. An attempt with the *Daedalus*, out of MIT, to nearly double its predecessor's world's record for human-powered flight. The plane, which is pedaled like a bicycle, is to make a five-hour, 74-mile flight across the Aegean, along roughly the route that Daedalus followed in myth. The flight may take place at any time during the period noted above.

JUNE 16–SEPTEMBER 24, ATHENS FESTIVAL. Performances by Maurice Bejart's ballet, the Vienna Staatsoper Ballet, Britain's National Theatre, London's Royal Philharmonic, the Bolshoi Ballet, the Stuttgart Ballet, and the Moscow Symphony, as well as performances of ancient dramas—all in the ancient Herod Atticus amphitheater, at the foot of the Acropolis.

JULY 20–AUGUST 5, TRIREME TRIALS, Poros. With the help of 170 volunteers serving as synchronized oarsmen, the *Olympias*,

a painstaking replica (two years in the building) of the ancient Greek warships, will be undergoing trials off the tiny island of Poros, a ferry ride away from Athens.

For information: Greek National Tourist Organization, 645 Fifth Ave., New York, NY 10022. (212) 421-5777.

ICELAND

SEPTEMBER, RETTIR, rural Iceland. Icelandic farmers make a community celebration out of the chore of sorting by owner the nation's million sheep and thousands of horses. They drive the animals, which have been grazing communally all summer, into huge circular pens, which are sectioned off like the spokes of a wheel.

For information: Iceland Tourist Board, 655 Third Ave., New York, NY 10017. (212) 949-2333.

Continued on page T-14

old and still ve social life.



When you're 1000 years old, you don't just celebrate for a day. That's why Dublin is holding a year-long party. The Millennium Celebration.

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VACATIONS IN EUROPE

■ **Lufthansa** offers a variety of ways to visit West Berlin during the city's summer as the **EEC Capital of Culture**. The *WunderHotels* program offers accommodations in Berlin at \$39 a night—and in some 80 other German cities, beginning at that rate. The *Classic Hotels* program offers a wider choice of accommodations, with breakfast, for 50-131.5 Deutsche marks, or about \$30-\$79, a night; the prices in this program are guaranteed in Deutsche marks only. And then, *City Vacations* packages are available for three or six nights (extra nights are possible) in some of the same hotels featured in the Classic Hotels program; prices run \$60-\$113 a night, including breakfast. (City Vacations in Berlin are not available September 10-30.) Lufthansa also offers its passengers special rates on German Railpasses and Avis rental cars in Germany. Round-trip APEX airfare from New York to Berlin runs \$564-\$877, depending on the month and the days of travel. (800) 645-3880.

■ By chartering a boat from *Valef Yachts* or *Arista Tours*, out of Athens's port city, Piraeus, in late July, you'd be able to follow the progress of the **Trireme Trials**. Rates begin at about \$130 a day for a bare-boat charter of a five-passenger sailboat and run up (and up and up) from there for larger, crewed sailing and motor yachts. Round-trip APEX airfare to Athens is additional; for July departures from New York on Olympic Airways it's running \$904-\$1,014. Either Valef, at (800) 223-3845, or Arista, at (718) 728-1200, can make the air arrangements for you.

■ *Aer Lingus Discover Ireland* packages can get you to Dublin for the city's **1,000th Anniversary Literary Festival**, in June, or **Theatre Festival**, in September and October, and make it easy to visit the rest of the country as well. The packages, which start at \$52 a day during these periods, include accommodations at any of some 30 hotels in Dublin—and about 140 hotels elsewhere in Ireland—breakfast, and the use of an Avis rental car (shared by two people). Airfare, \$545 on a round-trip APEX ticket from Boston or New York to Dublin, is additional. (800) 223-6537.

■ People signing on with *Country Cycling Tours* for the July or the August departure of the company's 14-day bicycling tour of the Netherlands—which visits Apeldoorn, Elburg, Stavoren, Hoorn, Lisse, and Amsterdam—will be able to take advantage of the **William & Mary Tercentenary** and the **100th Anniversary of the Concertgebouw**. The tour groups, which are limited to 20 participants, bike about 25 to 35 miles a day, along bike paths and country roads; they are accompanied by a van that carries the luggage and, sometimes, tired cyclists. \$2,366 includes round-trip airfare from New York, accommodations, all breakfasts and three

dinners, and occasional ground and water transportation within Holland. Bike rentals are available for an additional \$85-\$95, and helmet rentals for \$20. Departures May 14, July 19, and August 20. (212) 874-5151.

■ Estoril being the major beach town in Lisbon's environs, a visit to the **Costa do Estoril Music Festival** seems almost mandatory for sightseers in Portugal in July or early August. *Mill-Run Tours* offers three-night Estoril packages; \$135-\$255 (a range that reflects a range of hotel choices) includes accommodations and breakfast. The company also offers four 8-day to 14-day drive-yourself tours of Portugal. Participants start and end their tours in Lisbon, proceeding in between from one country *pousada* or hotel to the next. \$315-\$885, during the time of the festival, includes accommodations, breakfast, and the use of a rental car (shared by two people). Round-trip APEX airfare, \$652 from New York or Boston on TAP Air Portugal, is additional. (800) 645-5786 or (212) 486-9840.

Then again, *Sea Air Holidays* runs two deluxe tours of Portugal that stop in Estoril. The first, a 12-day tour, visits Lisbon and Madeira as well; \$1,549, during the time of the festival, includes round-trip airfare from New York to Portugal, deluxe accommodations, breakfast, and ground transportation within Portugal. The second, a 15-day tour, visits Oporto, Lisbon, and the Algarve as well as Estoril; \$1,849 includes the same things. Both tours depart every week, year-round. Sea Air, like Mill-Run, offers *pousada* tours of the countryside—but Sea Air's come in both drive-yourself and car-and-private-driver versions. (800) 732-6247 or (203) 356-9033.

■ *Keith Prowse & Co.* offers **Wimbledon** packages (and **Henley Royal Regatta** packages, and also sells British theater, opera, and ballet tickets stateside). The Wimbledon packages, available for one to six nights, include accommodations, breakfast, and reserved seats at the tournament. They range in price from \$69 to \$439 a night, depending on the stage of the tournament and the level of hotel chosen (the higher-priced packages include extra amenities, as well). Round-trip airfare, \$699 on a round-trip APEX ticket from New York, or \$594 from Miami, to London, is additional. (800) 992-9223 or (404) 980-1783.

■ *Valor Tours*, which specializes in military-related itineraries, is planning a nine-day **Armada 400** tour to Plymouth and London. \$1,265 includes accommodations, all breakfasts and four other meals, ground transportation within Britain, and a ticket to the re-opening ceremony for Buckland Abbey, a mansion and former monastery that Drake bought with the wealth he accumulated on his circumnavigation aboard the

Golden Hinde. Round-trip airfare, \$815 on an APEX ticket from San Francisco or Los Angeles to London, is additional. Departs July 18. (415) 332-7850.

■ *Tour Designs* is running a 24-day **Millennium History** tour led by a professor of Soviet history, for a maximum of 30 participants. The tour will visit sites key to the **1,000th Anniversary of the Russian Orthodox Church**—Moscow, Kiev, Odessa, Leningrad—and also the Catholic stronghold of Riga and the Methodist stronghold of Tallin. \$2,799 includes airfare from New York, accommodations, all meals, two theater tickets, and air and ground transportation within the USSR. Departs May 15. (202) 554-5820.

General Tours, too, can take you to Moscow and Leningrad in time for the celebrations in both those cities. Either the June 10 departure of the 10-day *Russia in Brief* tour, which visits only Moscow and Leningrad, or the June 9 departure of the 10-day *Medieval Russia* tour, which visits Suzdal as well, will do it. The maximum number of participants in each of these tours is 25. \$2,149 for *Russia in Brief* includes airfare from New York, accommodations, all meals, two theater tickets, one day excursion from Leningrad, and train transportation. \$1,999 for *Medieval Russia* includes all that, and coach transportation to Suzdal besides. (800) 221-2216.

The *Russian Travel Bureau*, another major tour operator, has several offerings that would put you in at least one of the celebrating cities. (800) 847-1800 or (212) 986-1500.

■ *Dailey-Thorp Travel* offers nearly three dozen one- to three-week deluxe tours to Europe which incorporate visits to leading music festivals and events—including the Bayreuth, Florence, Munich, Salzburg, Verona, and Vienna festivals, which are otherwise all but impossible to get tickets to. Most tours are for a maximum of 25 participants. About \$250 to \$450 a day includes deluxe accommodations, some meals, and ground and air transportation within Europe, as well as tickets to performances. Round-trip airfare is additional.

Dailey-Thorp is, as well, the U.S. representative for the European Association of Music Festivals (to which most of the major festivals on the Continent belong) and, as such, sells tickets to the events of all member festivals except the six named above. (212) 307-1555.

These are but a few samples of vacations incorporating events listed in the Travel Planner; your travel agent will be able to make many additional suggestions. The prices given were current at press time and are per person, double occupancy. Many of the tours and packages described offer options and include amenities, such as airport transfers and sightseeing excursions, beyond those mentioned here.

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Europe

Continued from page T-11

IRELAND

THROUGH DECEMBER, DUBLIN'S 1,000TH ANNIVERSARY. Otherwise known as *Baile Atha Cliath Ceiliuradh Mile Bliain*, the anniversary will occasion many concerts, historical and literary walking tours, sporting events, and exhibits of art and artifacts. A few events of particular extravagance or interest:

June 11-26, Literary Festival. The annual pilgrimage of James Joyce fans tracing Leonard Bloom's route in *Ulysses* will occur on June 12 this year, as one aspect of this festival. The others will include readings, performances, and lectures celebrating and explicating such personages as Joyce, Yeats, Beckett, Shaw, and Wilde.

July 9-10, Millennium Street Carnival and Birthday Party. Including the Lord Mayor's Parade, a once-annual celebration that hasn't been held in almost a century. This year it will be done in the style of medieval times, when the parade was known as the Riding of the Franchises. Fireworks, clowns, face-painters, street entertainers, a mass release of 100,000 balloons, and what is intended to be a cake of record-breaking proportions will bring the birthday up to date.

September 26-October 9, Theatre Festival. Another special edition of an annual event, with new Irish plays, revivals of classics, and imports as well.

OCTOBER 20-31, WEXFORD FESTIVAL OF OPERA. Wexford's specialty is rarely performed 18th- and 19th-century works. On this year's program are Busoni's *Turandot* and Gazzanvia's *Don Giovanni* (as a double bill), Mercadente's *Elise et Claudio*, and Dvorak's *Devil and Kate*.

For information: Irish Tourist Board, 757 Third Ave., New York, NY 10017. (212) 418-0800.

ITALY

APRIL 29-JUNE 30, MAGGIO MUSI-CALE FIORENTINO, Florence. The world premiere of Bussotti's *Inspirazione*, and also Britten's *Peter Grimes* and Puccini's *Tabarro*, *Suor Angelica*, and *Gianni Schicchi*. The Rotterdam Philharmonic, the Concertgebouw, the Gewandhaus Orchestra of Leipzig, the Munich Philharmonic, and other orchestras will give concerts.

JUNE 26-SEPTEMBER 25, BIENNALE ART EXHIBITION, Venice. The 51st such compendium of contemporary art. Denmark, France, West Germany, Greece, the Netherlands, Norway, Switzerland, the UK, the USSR, Canada, and the United States will be exhibiting, generally, the work of

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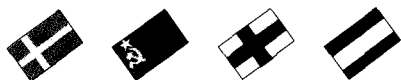
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Europe

one or two artists apiece. The U.S. pavilion will show "Jasper Johns: 1974-1988," from the Philadelphia Museum of Art.

JUNE 28-JULY 17, FESTIVAL OF TWO WORLDS, Spoleto. Still going by the same name, even though Gian Carlo Menotti's performing-arts empire has conquered a third world—Australia.

JULY 2-AUGUST 31, VERONA OUT-DOOR OPERA SEASON. Ponchielli's *Gioconda*, Verdi's *Aida*, Puccini's *Turandot*, and Theodorakis's ballet *Zorba the Greek*—all staged in the town's Roman amphitheater.

For information: Italian Government Travel Office, 630 Fifth Ave., New York, NY 10111. (212) 245-4822.

LUXEMBOURG

MAY 27-JUNE 26, ECHTERNACH FESTIVAL, Echternach. The Seoul Philharmonic and the Rheinland-Pfalz Philharmonie will be among the guests this year. Some festival performances are held in the Basilica and the ancient church of Sts. Peter and Paul.

JULY 29-AUGUST 7, FIRST WORLD HOT-AIR AIRSHIP CHAMPIONSHIP, Junglinster.

For information on the airship championship: Commune Aerostatique du Grande-Duché de Luxembourg, 7a rue de Bourglinster, L-6112, Junglinster, Luxembourg. For information on other events: Luxembourg National Tourist Office, 801 Second Ave., New York, NY 10017. (212) 370-9850.

MONACO

JULY 21-AUGUST 11, INTERNATIONAL FIREWORKS FESTIVAL. Shows on July 21 and 25 and August 4, 8, and 11, over the harbor. Entries from various countries, on several continents, will compete.

For information: Monaco Government Tourist and Convention Bureau, 845 Third Ave., New York, NY 10022. (212) 759-5227.

NETHERLANDS

APRIL 11-DECEMBER, 100TH ANNIVERSARY OF THE CONCERTGEBOUW, Amsterdam. The Concertgebouw (the hall, not the orchestra) has been undergoing renovation and expansion; the project's end will be celebrated with a series of grand re-opening concerts April 11, 13, 15, and 17. Atypically, the hall will be the venue for a jazz festival in late July. Also, this year's annual

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Europe

celebration to open Amsterdam's new cultural season will be held in the Concertgebouw and in front of it, August 26-28. Other special concerts in honor of the anniversary are planned as well.

JUNE 1-30, HOLLAND FESTIVAL, Amsterdam, The Hague, and Rotterdam. The operas will be Peter Sellars's productions of Adams's *Nixon in China* and Mozart's *Così fan tutte*, Gorecki's *Das Glas im Kopf wird vom Glas*, and two others in concert versions. The dance program will include Michael Clark, Merce Cunningham, Stephen Petronio, and the Netherlands Dance Theater.

JULY 5-DECEMBER 4, WILLIAM & MARY TERCENTENARY, Amsterdam, Hellevoetsluis, and Apeldoorn. The highlights are the exhibit "The World of William and Mary," at Amsterdam Nieuwe Kerk, July 5-September 30; an armada of some 200 ships sailing from Hellevoetsluis July 9, bound for Brixham, England; and a 17th-century garden exhibit at Apeldoorn's Palace Het Loo, August 31-December 4.

For information: Netherlands Board of Tourism, 576 Fifth Ave., New York, NY 10036. (212) 370-7360.

NORWAY

MAY 25-JUNE 5, BERGEN FESTIVAL. Including a series of operettas by the Budapest State Opera, Tchaikovsky's *Jeanne d'Arc* by the Royal Opera of Stockholm, and Mahler's *Symphony of a Thousand* by Czech soloists, a Czech choir, and the Bergen Philharmonic.

For information: Norwegian Tourist Board, 655 Third Ave., New York, NY 10017, (212) 949-2333; or Scandinavian Airlines System Tour/Events desk, (800) 221-2350.

POLAND

JUNE 2, CORPUS CHRISTI, throughout Poland. Surprisingly, an official national holiday. Poles everywhere celebrate Corpus Christi joyfully, with colorful processions through the streets.

For information: Polish National Tourist Office, 333 N. Michigan Ave., Chicago, IL 60601. (312) 236-9013.

PORTUGAL

JULY 6-AUGUST 15, COSTA DO ESTORIL MUSIC FESTIVAL. Classical-music concerts and recitals, plus an open-air jazz series.

NOVEMBER 6-11, SAO MARTINHO FAIR, Golega. A renowned auction of Portuguese horses, plus displays of horsemanship, folk dancing, and fireworks.

For information: Portuguese National Tourist Office, 548 Fifth Ave., New York, NY 10036. (212) 354-4403.

SPAIN

JUNE 18-JULY 6, MUSIC AND DANCE FESTIVAL, Granada. London's Philharmonia Orchestra and Royal Philharmonic will perform.

AUGUST 1-31, SANTANDER MUSIC FESTIVAL. The Royal Philharmonic, the Academy of Ancient Music with the London Symphony Chorus, and the Warsaw National Philharmonic Choir will perform.

For information: National Tourist Office of Spain, 665 Fifth Ave., New York, NY 10022. (212) 759-8822.

SWEDEN

JUNE 4-SEPTEMBER 7, DROTTNINGHOLM COURT THEATER FESTIVAL, Stockholm. The festival will open with Gluck's ballet *Don Juan* and continue with three operas: a new production of Mozart's *Finta giardiniera*, his *Clemenza di Tito*, and Gluck's *Paride ed Elena*.

JULY 5-10, TALL SHIPS VISIT, Karlskrona. The beginning of a month-long series of races and port visits in the Baltic by upwards of 80 ships, many of them naval training vessels. After gathering in Karlskrona, the ships will race to Helsinki, Finland, where they are expected to arrive July 15 and to remain in port until the 20th.

For information: Swedish Tourist Board, 655 Third Ave., New York, NY 10017, (212) 949-2333; or Scandinavian Airlines System Tour/Events desk, (800) 221-2350.

SWITZERLAND

THROUGH OCTOBER, "SUMMER IN THE MOUNTAINS", various localities. The title of this event is meant to encompass both annual activities and celebrations in honor of a host of Swiss anniversaries. An international walking competition will be held on the Sustenpass June 12; the 50th anniversary of the first ascent of the Eiger North Face will be commemorated in July; the Swiss Alpine Marathon will be run in Davos July 31; and the Swiss Alpine Club will celebrate its 125th anniversary, in St. Gallen, October 29-30.

JULY 1-16, MONTREUX JAZZ FESTIVAL. The program will be available in late May.

AUGUST 17-SEPTEMBER 10, FESTIVAL OF MUSIC, Lucerne. The 50th-anniversary edition promises to be a Matterhorn of a festival, with concerts by the Chamber Orchestra of Europe, the Academy of Ancient Music with the London Symphony Chorus, the Berlin Philharmonic, the Royal Philharmonic, the New York Philharmonic, the Concertgebouw, the Vienna Philharmonic, and London's Philharmonia Orchestra, among other orchestras.

AUGUST 26-OCTOBER 12, MONTREUX-VEVEY MUSIC FESTIVAL. The Moscow Philharmonic, the Concertgebouw, and the Peking Radio Symphony Orchestra will be among the guests this year.

For information: Swiss National Tourist Office, 608 Fifth Ave., New York, NY 10020. (212) 757-5944.

TURKEY

JUNE 20-JULY 15, ISTANBUL FESTIVAL. Mozart's *Abduction From the Seraglio*, a full program of classical concerts (primarily by chamber orchestras); dance by the Vienna Staatsoper Ballet and Maurice Bejart's and Twyla Tharp's companies; jazz and pop concerts by, among others, Miles Davis and Keith Jarrett; and performances of Turkish classical music and dance.

For information: Turkish Consulate General, 821 United Nations Plaza, New York, NY 10017. (212) 687-2194.

UNITED KINGDOM

MAY 16-AUGUST 18, GLYNDEBOURNE FESTIVAL OPERA. Including new productions of works by Janacek and Verdi. Be advised that at Glyndebourne people wear black tie even for the picnics on the lawn, at intermission.

JUNE 10-JULY 10, YORK FESTIVAL AND MYSTERY PLAYS. York's cycle of medieval mystery plays is performed only every four years, at historic sites around the city.

JUNE 20-JULY 3, LAWN TENNIS CHAMPIONSHIPS, Wimbledon. At the All-England Lawn Tennis and Croquet Club, 128 men and 128 women will compete in a Grand Slam tournament.

JUNE 29-JULY 3, HENLEY ROYAL REGATTA, Henley-on-Thames. The fashionable international rowing event.



Europe

JULY 1-28, ARMADA 400, Plymouth. In celebration of the 400th anniversary of Sir Francis Drake's victory over the Spanish Armada, Plymouth will present historical reenactments, a sound-and-light show on the theme of Drake, a musical comedy on the theme of Drake, and Elizabethan entertainments. An associated exhibition will be on view at the National Maritime Museum, in Greenwich, April 20–September 4.

JULY 31–AUGUST 7, COWES WEEK AND THE MUMM ADMIRAL'S CUP SERIES, Isle of Wight. Topping yachting.

AUGUST 14–SEPTEMBER 3, EDINBURGH FESTIVAL. Still the world's biggest arts festival.

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For information: British Tourist Authority, 40 West 57th St., New York, NY 10019. (212) 581-4700.

USSR

MAY 5-13, MOSCOW STARS ARTS FESTIVAL. Operas and ballets by the Bolshoi Theater and the Stanislavsky and Nemirovich-Danchenko Musical Theater, chamber operas by the Chamber Music Theater, and concerts of old Russian choral music in the former Znamensky Cathedral.

JUNE 5-16, 1,000TH ANNIVERSARY OF THE RUSSIAN ORTHODOX CHURCH, Moscow, Kiev, Leningrad, Vladimir, and Novgorod. Although the original mass baptism, decreed by Prince Vladimir, took place in the River Dnieper at Kiev, Moscow will be the focal point of this year's commemorative celebrations. The Divine Liturgy will be celebrated on June 5 at the Cathedral of the Epiphany, which is the seat of the Patriarch, and on June 12 (along with a reception by Patriarch Pimen) at the Trinity Cathedral of Danilov Monastery, an ancient church now under renovation and soon to become the new seat of the Patriarch. Various other celebrations, including the promulgation, at Danilov Monastery, of a Jubilee Act dedicated to the Millennium will be held in Moscow June 10-13. Celebrations in the other four cities will be held June 14-16.

JUNE 21-29, WHITE NIGHTS, Leningrad. This is almost midnight-sun country. Leningrad celebrates the solstice with performances by the Kirov Opera and Ballet Theater, the Leningrad Philharmonic, and other groups.

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■ AUSTRALIA

THROUGH DECEMBER, BICENTENNIAL CELEBRATIONS, throughout Australia. Some of the more notable components:

Through April 15, Trans-Australia Balloon Challenge, Perth to Sydney. Circa 88 of the world's top balloon teams are competing.

April 23–May 1, Australian Bicentennial Balloon Championship, Canowindra.

April 24–July 16, Great Australian Camel Race, Ayers Rock to Carrara. More than 100 camels and their "cameleers" will traverse the 3,297-km route, from the Outback to Surfers Paradise, on the Gold Coast, in pursuit of \$A100,000 in prize money.

May 5–15, World Boomerang Cup, Yulara and Alice Springs.

May 8–20, FIVA International Rally, from Brisbane, Sydney, Adelaide, and Hobart to Canberra. Under the auspices of the Federation Internationale Vehicules Anciens, veteran and vintage cars will converge on the national capital.

July 15–August 8, Festival of Bands, Brisbane. Brass and concert bands from Europe, the U.S., Japan, and New Zealand will take part.

August 6, Re-opening of the Old Ghan Passenger Railway Line, Alice Springs. A restored steam train and 30 kilometers of the narrow-gauge railway outside town will be ready for business.

August 11–15, World Cup Downhill Skiing, Thredbo.

October 8–16, Air Show, Sydney. Planned

to be the largest aviation event ever held in the Southern Hemisphere.

APRIL 30–OCTOBER 30, WORLD EXPO, Brisbane. Exhibits by nearly three dozen nations and 20 corporations will present variations on Expo's theme of "Leisure in the Age of Technology." A\$31 million is going into free entertainment alone: every day there will be a laser show, fireworks, marching-band and pop-music performances, two parades, three or four circus shows, and five aquatic shows. The attractions for which there will be an extra charge include performances by London's Royal Ballet (August 1–6) and the Bolshoi Opera (October 20–23).

MAY 11–JULY 3, SYDNEY BIENNALE, Sydney and Melbourne. Painting, sculpture, and performance and site works, 1940–1988, by 88 modern and contemporary artists (including such notables as Braque, De Kooning, Matisse, Miro, Picasso, and Rothko) from some 20 countries.

JUNE 7–OCTOBER 29, SYDNEY OPERA SEASON. In that marvelous opera house on the harbor the Australian Opera will present an eclectic season of 13 works that, by accident or design, gets more modern as it goes along. It will begin with Verdi's *Forza del destino* and Monteverdi's *Incoronazione di Poppea*, and end with Poulenc's *Dialogues of the Carmelites* and Bock's *Fiddler on the Roof*. (Qantas passengers in the U.S. may reserve dinner-and-opera packages along with their air tickets.)

SEPTEMBER 2–17, SPOLETO FESTIVAL, Melbourne. And now it's the Festival of Three Worlds. Opera, dance, theater, music, and visual-arts exhibits—just as in the sister festivals in Spoleto, Italy, and Charleston, South Carolina.

SEPTEMBER 18–OCTOBER 4, WARANA, Brisbane. The Bolshoi Ballet, a Chinese acrobatic troupe, and the London Mime Theatre will be among the guests at this springtime arts festival.

For information: Australian Tourist Commission, 489 Fifth Ave., New York, NY 10017. (212) 687-6300.

■ BHUTAN

OCTOBER 17–19, WANGDIPHODRANG TSHECHU, Kuruthang. The monks of Wangdiphodrang Dzong perform ancient dances to the accompaniment of cymbals and long, booming brass horns. The festival concludes with the raising of the *thanka* (a pictorial silk scroll 40 feet high and 60 feet long) and a blessing ceremony.

OCTOBER 24–28, JAMBE FESTIVAL, Jakar. The festival opens with a nighttime ceremony of ancient music and dance, under a full moon. At the end of the ceremony a huge arch of pine boughs is set afire, and those who choose to participate run underneath it, in order to expiate their sins of the previous year. Folk and religious dances are performed on the subsequent days, and the festival concludes with a blessing ceremony.

For information: Bhutan Travel Service, 120 E. 56th St., New York, NY 10022. (212) 838-6382.

■ CHINA

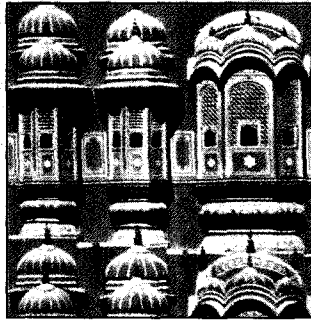
THROUGH DECEMBER, YEAR OF THE DRAGON CELEBRATIONS, throughout China. Years of the Dragon are reputed to be especially happy and fortunate; this one is occasioning the first celebrations ever sponsored by China's official International Travel Service. Beijing will host free cultural shows each month and a large Dragon Dance Fair September 4–10; Guangzhou a Mid-Autumn Dragon Lantern Festival, on September 28; Hangzhou boat rides on West Lake throughout the year; and Liuzhou both Dong and Jin nationality festivals, on April 18 and July 23 respectively. Most of these cities, and others, notably Nanning, will also hold festive dragon-boat races on June 18 or 19.

AUGUST 6, TORCH FESTIVAL, the Stone Forest. The Stone Forest, in Yunnan province, is a natural spectacle of huge, jagged limestone formations. Each year the local

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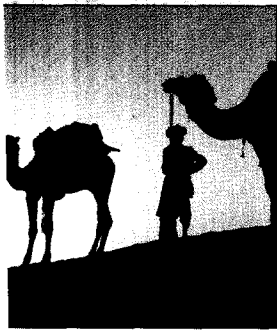
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VACATIONS IN ASIA, OCEANIA, & AFRICA

■ Participants in a 15-day *Australian Art Tour* offered by *Promotional Tours*, and led by a San Francisco gallery owner and art educator, will be able to take full advantage of the **Sydney Biennale** and the **World Expo**. The tour, for a maximum of 40 participants, will visit Melbourne, Sydney, and Brisbane. \$2,575 includes round-trip airfare from Los Angeles or San Francisco, accommodations, all breakfasts and three dinners, and airfare within Australia. Departs May 12. (800) 343-4070 or (617) 734-3100.

■ Suppose you wanted to see Australia and thought you'd like, while you were there, to attend the **Spoleto Festival**, in Melbourne, and **Warana** and the **World Expo**, in Brisbane. One way to do it would be to buy a *Qantas APEX* ticket from San Francisco or Los Angeles to Melbourne (or Brisbane or Sydney), for \$1,095, and rent a Budget campervan for, say, 18 days, at \$88 a day for a medium-sized one. Total cost per person for two: \$1,887, excluding food and gas. *Qantas Jetabout*, which also brokers car rentals, Austrailpasses, Hotelpasses, Australian home stays and farm holidays, and more conventional Australia and South Pacific packages, can make the arrangements. (800) 641-8772 or (213) 641-8770.

Another way to do it would be to join *Lindblad Travel's* 18-day *Classic Australia* tour, on its September 1 departure. The tour, for a maximum of about 30 participants, visits Melbourne, Ayers Rock, Alice Springs, Brisbane, Heron Island, and Sydney. \$5,130 includes round-trip airfare from San Francisco, accommodations, breakfasts and some other meals, ground and air transportation within Australia, and an overnight cruise on the Hawkesbury River. An optional seven-day extension to New Zealand is available, for \$1,825 more. Seven departures, from April 28 to December 8 (though only the September 1 departure will put you on the spot for the arts festivals). (203) 226-8531.

■ *Innerasia Expeditions'* 20-day *Great Festivals of Bhutan* tour visits both the **Wangdiphodrang Tshechu** and the **Jambe Festival**. The tour, for a maximum of 15 participants, visits Calcutta; Thimphu, Kuruthang, Gangteng Gompa, Tongsa, Jakar, and Paro, Bhutan; and Bangkok. \$4,100 includes round-trip airfare from San Francisco, accommodations, all meals in Bhutan, and ground and air transportation within Asia. Departs October 13. (800) 551-1769 or (415) 922-0448.

■ Although *Asian Pacific Adventures* is probably better known for its bicycling tours in the Orient, it also offers special-interest and adventure tours. Case in point: the 23-day **Tashilhunpo Festival Explorer** tour, for a maximum of 19 participants, visiting Chengdu, Sichuan; Lhasa, Xigaze, Gyanze,

and Zedang, Tibet; Kathmandu, Nepal; Bangkok; and Hong Kong. About \$4,200 includes round-trip airfare from Los Angeles, San Francisco, or Seattle; accommodations (including some fairly rudimentary ones); all meals in China and Tibet and most meals elsewhere; and air and ground transportation within Asia. At press time the departure was scheduled—tentatively, since the dates of the festival were still tentative too—for September 8. (213) 935-3156.

■ If you choose your departure date cleverly, most any of *Pacific Delight's* 40 tours to China or China and the Orient will get you to Beijing in time for the big **Year of the Dragon** Dragon Dance Fair, September 4-10. June 18 and 19, when dragon-boat races will be held in cities throughout the country, is another good time to plan around. Pacific Delight tours range in length from 14 to 28 days and in price from \$2,310 to \$4,480; they include airfare from the West Coast, all meals in China, some meals elsewhere, and ground and air transportation in the Orient. (800) 221-7179 or (212) 684-7707.

■ *Royal Journeys'* 24-day *India and the Pushkar Fair* tour is part of the company's series of photographic tours, which are escorted by an expert photographer as well as a tour guide. The tour, for a maximum of 25 participants, will visit Delhi, Varanasi, Khajuraho, Agra, Bharatpur, Jaipur, Udaipur, Jodhpur, Jaisalmer, and Ajmer. \$3,395 includes deluxe accommodations; all meals; ground, water, and air transportation within India; and evening photography workshops. Round-trip airfare to Delhi, about \$1,175 in economy class from New York, is additional. Departs November 2. (206) 443-9027.

■ You can make all kinds of arrangements to see a performance of "**Nabucco**" in Jerusalem. The least expensive is *El Al's Nabucco Special*, intended for those who wish to stay with family members or friends in Israel; \$1,189 includes round-trip airfare from New York and an opera ticket. El Al also offers 12-day *Nabucco Package* tours, visiting Jerusalem, the Galilee, and Tel Aviv. \$1,699-\$2,029 includes round-trip APEX airfare from New York to Tel Aviv, 10 nights' accommodations (the price range reflects a range of hotel choices), breakfast, an opera ticket, and ground transportation within Israel. Departures May 18 and 25. (800) 352-5786.

Unitours, too, offers two *Nabucco* packages. The first includes airfare from New York, five nights at the King David Hotel, breakfasts and two dinners, and an opera ticket. It costs \$2,176; the departure date is May 16. The second includes round-trip *Concorde* airfare from New York to Tel Aviv, four nights' deluxe accommodations, and a ticket to the opera's premiere. It costs \$9,999; the departure date is May 12. (800) 223-1780 or (203) 629-3900.

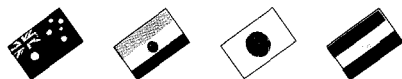
■ Japan is said to be the world's most expensive destination at present, and yet travel bargains still exist. For example, *Kintetsu International Express* offers an *Ichiban Week* package for \$1,199 (through May) or \$1,249 (June–October), which includes airfare from New York and accommodations for six nights. Extended stays are possible; accommodations for each additional night cost \$51. Participants may remain in Tokyo throughout their stay or buy a seven-day Japan Rail Pass, for 27,000 yen (or about \$210), and move on after three nights to any of some 40 other cities—including Sapporo and Hakodate, for the **World Food Festival**, and Nagoya, for the **World Puppetry Festival**. (800) 422-3481 or (212) 307-0827.

■ The problem with the marvelous **Serengeti Migration** is that the wildebeest don't adhere to a rigid schedule; the best you can do is choose a safari leaving at a likely time, and hope. *Royal Viking Tours*, a new offshoot of Royal Viking Cruises, has scheduled its deluxe 15-day *Kenya* safari for the likely times of mid-September and mid-November. The tour, for a maximum of 22 participants, will visit Nairobi, Amboseli, the Taita Hills, Samburu, Nanyuki, Lake Naivasha, and the Masai Mara reserve. \$6,187 includes round-trip APEX airfare from New York to Nairobi, the most deluxe accommodations available under the circumstances, all meals, air and ground transportation within Kenya, and a hot-air balloon excursion over the Masai Mara. Departures September 5 and November 4. (800) 426-5478 or (415) 391-4736.

■ *Olson-Travelworld*, the U.S. General Agent for travel to the **Olympic Games**, offers package tours to the Games and sells separate tickets to, frankly, the less popular events. The packages start at \$2,250, for airfare from the West Coast, five nights' accommodations, breakfast, and priority on Olympics tickets. (800) 992-9511.

Also, *Tiller International* offers two 16-day *Seoul Olympics, Korea, Thailand, and Hong Kong* tours, each for a maximum of 25 participants. The tours will visit Seoul and Kyongju, Korea; Bangkok and Lop Buri, Thailand; and Hong Kong. \$4,578 includes airfare from San Francisco, accommodations, most meals, and tickets to Olympic events, including either the opening or the closing ceremony. Two departures, September 15 and 28. (415) 397-1966.

These are but a few samples of vacations incorporating events listed in the Travel Planner; your travel agent will be able to make many additional suggestions. The prices given were current at press time and are per person, double occupancy. Many of the tours and packages described offer options and include amenities, such as airport transfers and sightseeing excursions, beyond those mentioned here.



Asia, Oceania, & Africa

Sani tribesmen gather in the largest open space in the Forest to feast, sing, dance, and have wrestling matches, horse races, and "bullfights," which pit water buffalo against water buffalo.

MID-SEPTEMBER, TASHILHUNPO FESTIVAL, Xigaze, Tibet. The monks of Tashilhunpo Monastery spend the entire night before the festival chanting. The following morning the nearby park fills with elaborately costumed and masked dancers, who perform all that day and the next.

For information: *China National Tourist Office*, 60 E. 42nd St., New York, NY 10165. (212) 867-0271.

FRENCH POLYNESIA

LATE JUNE-MID-JULY, TIURAI, throughout French Polynesia. A Bastille Day celebration gone native. Tahiti holds outrigger-canoe races, fruit-carriers' and sand-carriers' races, stone-lifting and javelin-throwing competitions, and Polynesian song and dance competitions, which draw troupes from the Cook Islands, Samoa, and other islands. The outlying islands, including Moorea, Bora Bora, Raiatea, Tahaa, and Huahine, celebrate in a less organized way but with equal *joie de vivre*.

For information: *Tahiti Tourist Promotion Board*, 12233 W. Olympic Blvd., Los Angeles, CA 90064. (213) 207-1919.

HONG KONG

JUNE 25-26, DRAGON BOAT FESTIVAL. The hectic, fantasmagoric dragon-boat races are among the splashiest anywhere, attracting rowing teams from the world over.

OCTOBER 14-31, FESTIVAL OF ASIAN ARTS. Hong Kong plays host to a host of traditional dance, drama, and music groups from all corners of the Orient.

For information: *Hong Kong Tourist Association*, 548 Fifth Ave., New York, NY 10036. (212) 869-5008.

INDIA

JULY 15, RATH YATRA, Puri. Some say this is India's most spectacular temple festival. To honor Lord Jagannath, lord of the universe, pilgrims from all over the country draw huge, richly decorated temple chariots through the streets in procession. Puri is on the Bay of Bengal, about a third of the way from Calcutta to Madras.

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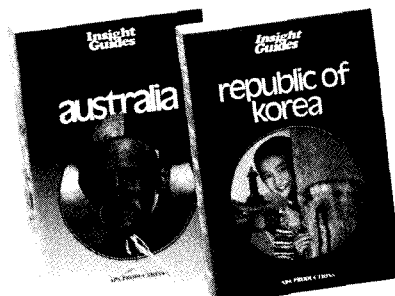
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Asia, Oceania, & Africa

NOVEMBER 20-23, PUSHKAR FAIR. For days in advance people on horseback and camelback and in bullock-carts, jeeps, and cars converge on Pushkar, near Ajmer, in Rajasthan. A huge cattle market, the world's largest camel market, and horse and camel races are the main draws, and there's also a very authentic crafts market.

For information: Government of India Tourist Office, 30 Rockefeller Plaza, North Mezzanine, New York, NY 10112. (212) 586-4901.

INDONESIA

JUNE 7, GALUNGAN DAY, throughout Bali. Galungan, the most important day of the Balinese year, commemorates the world's creation and the victory of good over evil. Offerings are made and ceremonies held.

OCTOBER 16-23, SEKATEN, Yogyakarta. A fair and a Moslem pageant centering on two ancient sets of gamelan instruments. A procession brings them from the Sultan's Palace to the Grand Mosque, where one or the other of them is played continuously (except on Thursday night and Friday morning), until the close of the festival, when another procession returns them to the Palace.

For information: Indonesian Consulate General, 3457 Wilshire Blvd., Los Angeles, CA 90010. (213) 383-5126.

ISRAEL

APRIL 20—APRIL 20, 1989, 40TH ANNIVERSARY OF INDEPENDENCE.

April 20, Memorial Day. An evening ceremony will mark the end of the day in remembrance of Israel's war dead and the beginning of Independence Day. In Tel Aviv the Israel Philharmonic will give an outdoor concert, and in Jerusalem there will be a torch-lighting ceremony at Mount Herzl and a show of folk songs and dances.

April 21, Independence Day. Jerusalem will host another folkloric show, a re-enactment of the 1948 signing of the Declaration of Independence, a parade of international bands, and another Philharmonic concert.

July 5-13, "The Negev Celebrates," with multi-media shows presented in the natural amphitheater at the Negev Brigade Memorial, sound-and-light shows at Masada, a hot-air balloon contest at Tel-Arad, and festivals of Third World performing arts at Park Eshkol and Israeli song at Arad.

MAY 14—JUNE 11, ISRAEL FESTIVAL, Jerusalem. The guests will include the Frankfurt Opera, Maurice Bejart's ballet company, the Market Theater of Johannesburg, and the Piccolo Teatro di Milano.

MAY 15-29, "NABUCCO," Jerusalem. The opera's artistic director, Vittorio Rossi, also did the *Nabucco* at Bercy, in Paris, last year—a less ambitious production that 200,000 people nonetheless turned out for. But comparisons to last year's *Aida* spectacular at Luxor, Egypt, are perhaps more to the point. Verdi's *Nabucco* is, of course, set in Jerusalem; it will be performed at the Sultan's Pool, a natural amphitheater that seats 7,800 and that will somehow be made to accommodate performers including London's Royal Philharmonic, internationally known soloists, a 250-voice-strong chorus, and a non-singing cast of 800 or so.

For information: Israel Ministry of Tourism, 350 Fifth Ave., New York, NY 10118. (212) 560-0650.

JAPAN

THROUGH AUGUST 31, SETO OHASHI BRIDGE EXPO, Sakaide City. The opening of an engineering marvel of a bridge between the main island of Honshu and semi-rural Shikoku is the excuse for devoting 150 acres (on the Shikoku side) to the theme of "Communication and Creativity for the 21st Century." Exhibits relate to everything from the present and future of robots, transportation systems, and electronic equipment to nature, food, health, and sports.

APRIL 14-15 AND OCTOBER 9-10, TAKAYAMA FESTIVALS. Traditional folk festivals in a mountain town not far from the Japan Alps National Park. The starring attraction is a parade of elaborate, ancient floats. There are also performances by special puppets, performances of special folk music, and a parade of gongs.

APRIL 24—OCTOBER 23, SILK ROAD EXPO, Nara. A celebration of the cultures, history, and arts and crafts of those living along the ancient route. Treasures on loan from the USSR, Syria, and India will be displayed in various pavilions. One pavilion will be maintained at 120 degrees, 0 humidity, to simulate the climate of the desert along the road.

JUNE 3—OCTOBER 30, WORLD FOOD FESTIVAL, Sapporo and Hakodate. The international exhibitors at this festival on Hokkaido, Japan's northernmost island, will include the USSR, China, Korea, Peru, various European nations, Alaska, Massachusetts, and the UN. Japanese food companies and up to 70,000 local restaurants will be participating as well.

JULY 8—SEPTEMBER 18, FUTURE WATCH, Gifu. An exposition surveying the technological, cultural, natural, and psychological faces of the future.



Asia, Oceania, & Africa

JULY 27–AUGUST 11, WORLD PUPPETRY FESTIVAL, Nagoya, Iida, and Tokyo. The first world puppetry festival to be held in Asia. Thirty Japanese and 30 guest puppet companies, from countries as disparate as the U.S. and Vietnam, will perform in Nagoya through August 3. August 4–8 Iida will take over, presenting a special edition of its annual puppetry festival, which is generally the largest in Japan. The festival will conclude in Tokyo August 9–11.

For information: Japan National Tourist Organization, 630 Fifth Ave., New York, NY 10111. (212) 757-5640.

■ KENYA

AUGUST OR SEPTEMBER AND OCTOBER OR NOVEMBER, SERENGETI MIGRATION, Masai Mara National Game Reserve. This procession of hundreds of thousands of wildebeest and thousands of zebra is a great natural spectacle. Whenever the animals have had their fill of Tanzania's Serengeti plains—possibly as early as July, but more often in August or September—they flood into Kenya, in search of greener pastures. A few months later the animals mass again, for the return.

For information: Kenya Tourist Office, 424 Madison Ave., New York, NY 10017. (212) 486-1300.

■ SOUTH KOREA

AUGUST 5–OCTOBER 7, OLYMPIC FESTIVAL OF ARTS AND CULTURE, Seoul. Performances by La Scala Opera August 5–13 and the Comedie Francaise August 30–September 2. Among the further international events will be opening galas August 17–19, the Seoul International Music Festival August 17–October 2, the Seoul Olympic Drama Festival August 18–October 6, the Seoul Olympic Dance Festival August 22–October 5, and exhibits of contemporary paintings and sculpture August 17–October 5. An open-air Korean Folklore Festival will be held September 11–October 2, and exhibitions of ancient and modern Korean arts will be on view from August 17 onward.

SEPTEMBER 17–OCTOBER 2, OLYMPIC GAMES, Seoul.

For information: Korea National Tourism Corporation, 460 Park Ave., New York, NY 10022. (212) 688-7543.

■ MOROCCO

JUNE, NATIONAL FESTIVAL OF POPULAR ARTS, Marrakech. For two weeks

hundreds of dancers, singers, acrobats, and so-called blue men, garbed in traditional blue robes, perform in the ruins of El Badia Palace.

For information: Moroccan National Tourist Office, 20 E. 46th St., New York, NY 10017. (212) 557-2520.

■ NEPAL

MAY 13, BUDDHA JAYANTI, Lumbini. A celebration of Buddha's birth, enlightenment, and death (that is, his attainment of Nirvana), all of which are said to have taken place on this date, in different years. Lumbini, Buddha's birthplace, holds a huge fair in his honor.

SEPTEMBER 29–OCTOBER 6, BADA DASAIN, throughout Nepal. Nepal's biggest festival, which honors the goddess Durga Bhavani and represents a victory of good over evil. For the first seven days the battle is fought—most conspicuously by sacrificing water buffalo, goats, and chickens at the Hanuman Dhoka Palace, in Kathmandu. On the eighth day and for four days thereafter people receive *tika*, a sign of the victory, and they give parties and feasts.

For information: Royal Nepalese Embassy, 2131 Leroy Place, NW, Washington, DC 20008. (202) 667-4550.

■ NEW ZEALAND

JULY 23–31, WINTER FESTIVAL, Queenstown. The town, on Lake Wakatipu, in the Southern Alps, hosts skiing and other snow-related competitions, and end-of-the-day festivities. The festival is held at the beginning of New Zealand's ski season, which runs through September.

For information: New Zealand Tourist and Publicity Office, 630 Fifth Ave., New York, NY 10111. (212) 698-4650.

■ WESTERN SAMOA

OCTOBER–NOVEMBER, RISING OF THE PALOLO. Samoans consider the palolo, a sea annelid, a great delicacy. When it emerges from the reef, in a phase of its annual reproductive cycle, people turn out in force with nets. Palolo-scooping is an all-night activity, done by the light of gas lanterns, and it puts everyone (here and also on the American side of the island) in a carnival-like mood.

For information: Samoa Mission to the UN, 820 Second Ave., New York, NY 10017. (212) 599-6196.

■ SINGAPORE

JUNE 19, DRAGON BOAT FESTIVAL. Southeast Asia's most colorful and hotly contested dragon-boat races. Teams from other Asian countries, Australia, New Zealand, and the U.S., as well as Singapore, battle it out off the shore of East Coast Park.

JULY, BIRD-SINGING CONTESTS, throughout Singapore. Hundreds of owners of shama, mata puteh, merbok jambul, and hwamei birds bring their cages to outdoor sites, where judges rate them on the loudness and variety of their songs, and on stamina, display, and overall appearance. There will be regional competitions, a Bird Talent Parade, and, finally, the nationals.

For information: Singapore Tourist Promotion Board, 342 Madison Ave., New York, NY 10173. (212) 687-0385.

■ TAIWAN

JUNE 26, BIRTHDAY OF CHENG HUANG, Taipei. Lion and dragon dances celebrate the city god's birthday.

SEPTEMBER 28, TEACHERS' DAY, Taipei. A national holiday otherwise known as the Birthday of Confucius (himself otherwise known as Kung Fu Tze). Commemorative ceremonies are held at all the Confucian temples; the principal one takes place at the temple in the capital.

For information: Taiwan Visitors' Association, 166 Geary St., San Francisco, CA 94108. (415) 989-8677.

■ TANZANIA

AUGUST OR SEPTEMBER AND OCTOBER OR NOVEMBER, SERENGETI MIGRATION, Serengeti National Park. The opposite perspective on the processions of wildebeest and zebra described under "Kenya." Tanzania's Serengeti park is the less convenient and somewhat more expensive, but also less crowded, place from which to view the spectacle.

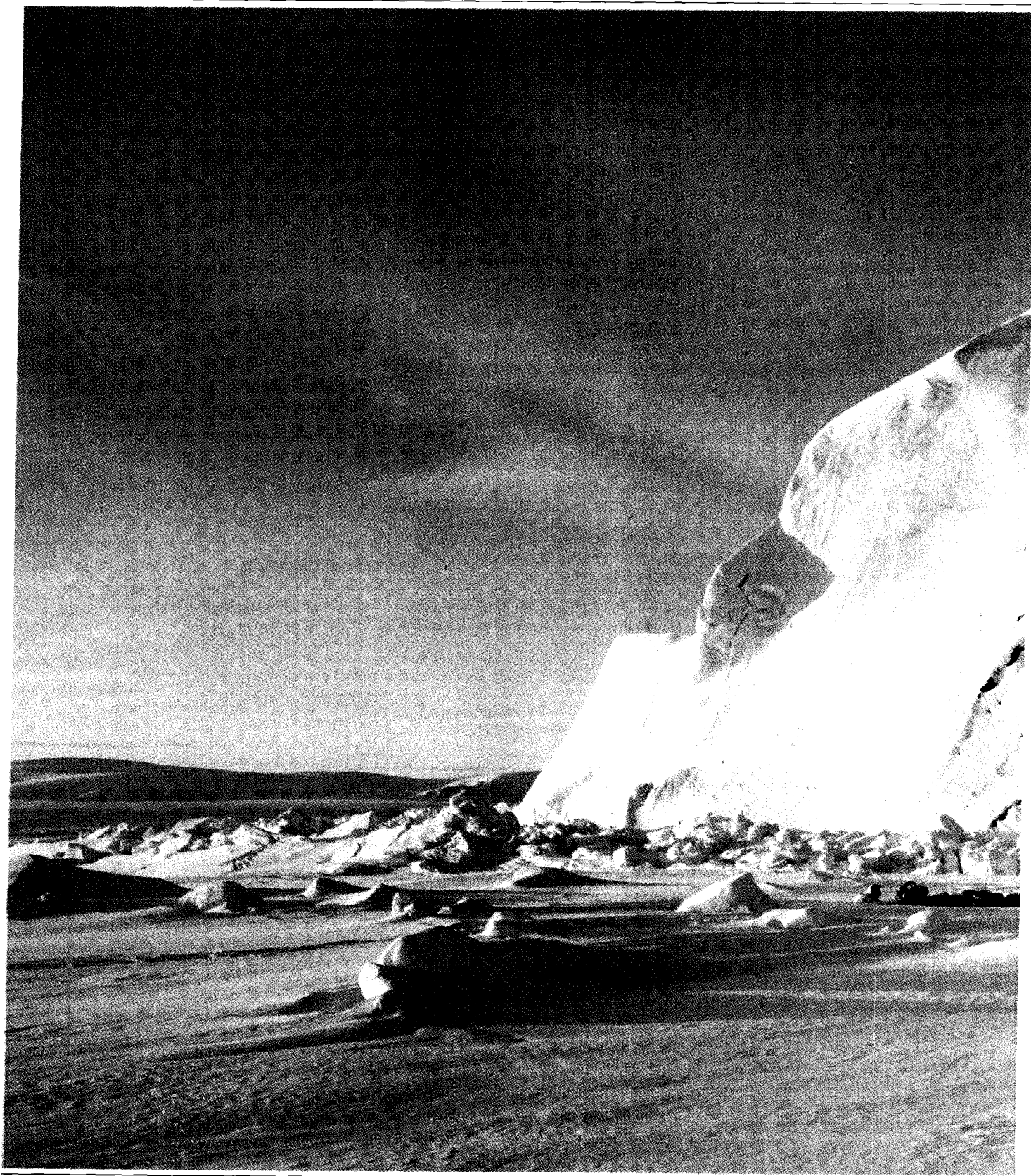
For information: Tanzania Tourist Corporation, 235 E. 42nd St., New York, NY 10017. (212) 972-9160.

■ THAILAND

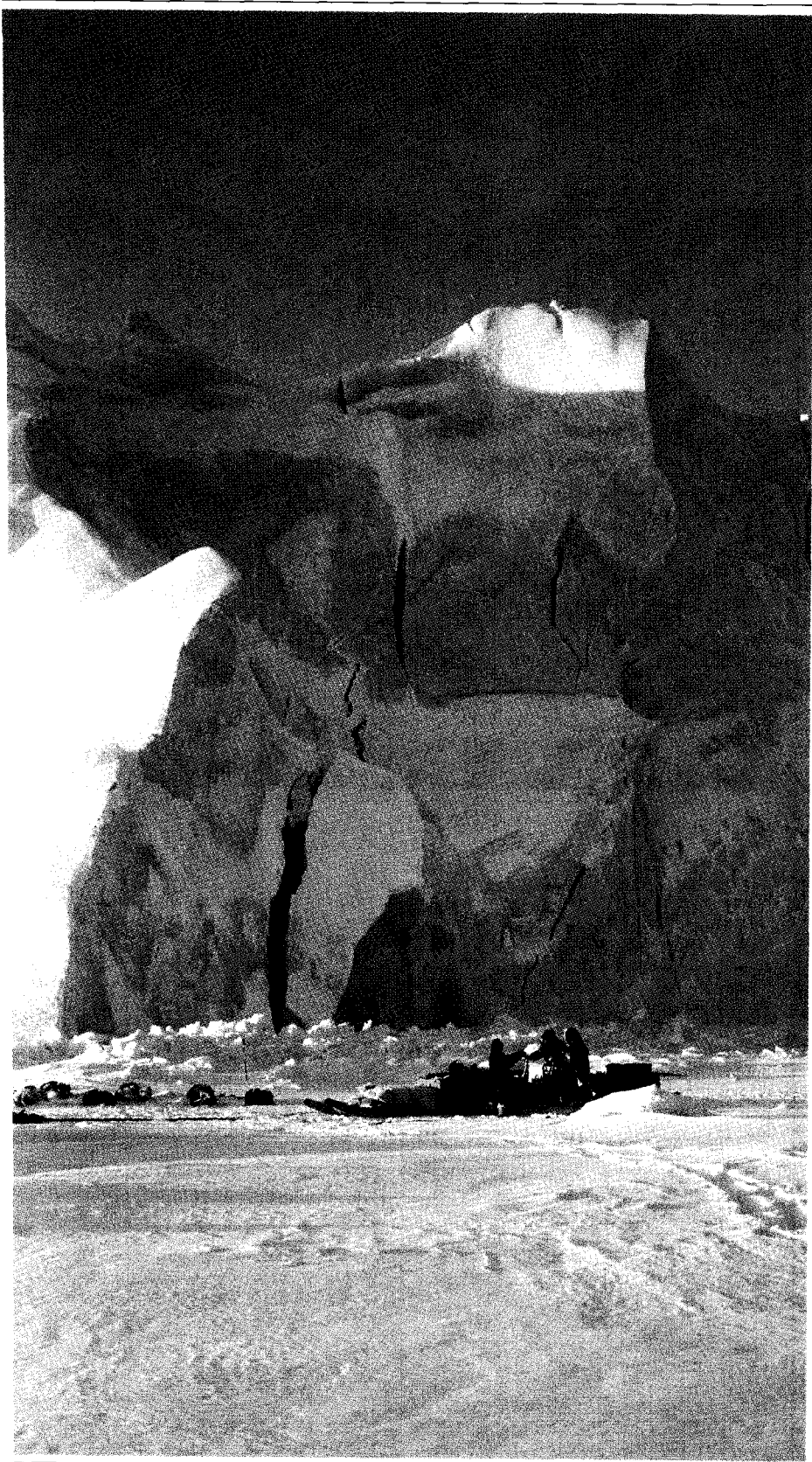
NOVEMBER 19–20, ELEPHANT ROUND-UP, Surin. More or less an elephant rodeo.

For information: Tourism Authority of Thailand, 5 World Trade Center, New York, NY 10048. (212) 432-0433.

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CANADA

ATLANTIC PROVINCES

THROUGH DECEMBER, SOIREE, throughout NF. The entire province is throwing a party for the capital, St. John's, on the occasion of its centennial of municipal government. The festivities (which are, if truth be told, by and large annual events) will include the Hangashore Folk Festival, in Corner Brook, July 2-3; the Fresh Shore Shrimp Festival, in Port au Choix, Hawke's Bay, and Port Saunders, July 11-17; the Exploits River Salmon Festival, in Grand Falls, Bishop's Falls, and Windsor, July 15-27; the Fish, Fun, and Folk Festival, in Twillingate, July 21-24; and St. John's own Great International Salt Fish Festival and Regatta, July 29-August 7.

JUNE 21-OCTOBER 8, CHARLOTTE-TOWN FESTIVAL, PEI. A music-theater series. Year after year—for 24 seasons, to be exact—people have been coming back to see *Anne of Green Gables*, based on the novel by Lucy Maud Montgomery. For the full program or tickets: (902) 566-1267 or, from early May on, (800) 565-0278.

JUNE 28-JULY 4, NOVA SCOTIA TATTOO, Halifax. The highlight is the daily two-hour show featuring U.S., Canadian, and German military bands and the Flying Danish Acrobats, among others.

AUGUST 7-20, FESTIVAL BY THE SEA, Saint John, NB. About 500 musicians, dancers, actors, and other artistes from all over Canada give three major performances each day, plus enough minor ones to bring the festival's total above 200.

AUGUST 11-27, BUSKERS, Halifax, NS. The world's largest festival of street performers. The musicians, jugglers, acrobats, storytellers, fire-eaters are recruited from all over Canada, the U.S., and Europe.

For information: Tourism New Brunswick, P.O. Box 12345, Fredericton, NB, Canada E3B 5C3. (800) 561-0123.

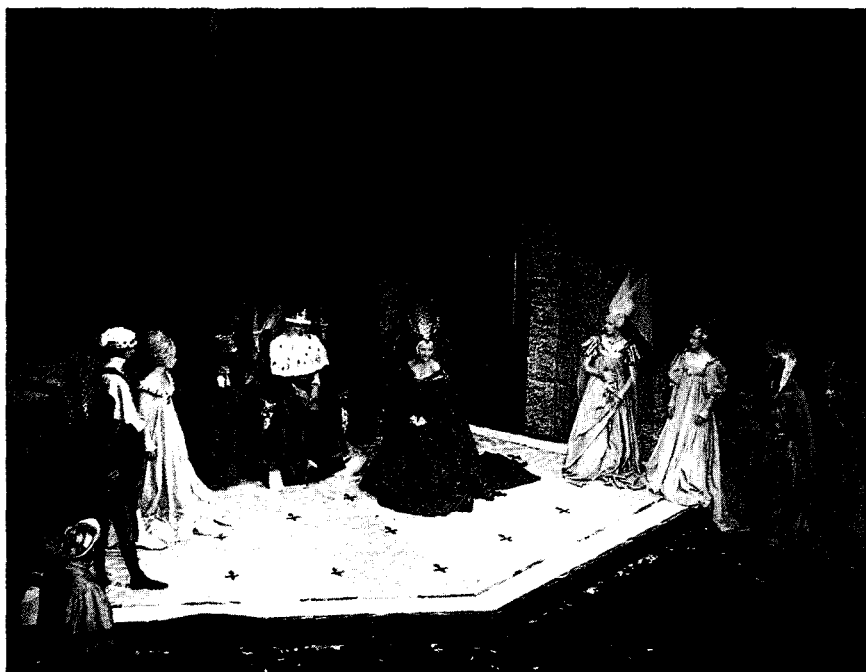
Newfoundland Tourism Branch, P.O. Box 2016, St. John's, NF, Canada A1C 5R8. (800) 563-6353 or (709) 576-2830.

Nova Scotia Dept. of Tourism, P.O. Box 130, Halifax, NS, Canada B3J 2M7. (800) 341-6096 or, from Maine, (800) 492-0643.

Prince Edward Island Visitor Services Division, P.O. Box 940, Charlottetown, PEI, Canada C1A 7M5. (800) 565-9060 from the eastern U.S., or (902) 368-4444.

QUEBEC

MAY 28-JUNE 23, BENSON & HEDGES FIREWORKS CONTEST, Montreal. Eight



At the Stratford Festival, in Stratford, Ontario

pyrotechnic firms from around the world will compete in "classical" and "pyro-musical" events, and everyone will head for La Ronde, on Ile Sainte-Helene, to watch. The heats, as it were, of the contest are held on Wednesday and some weekend evenings.

JUNE 16 AND 18, "AIDA," Montreal. The opulent production of Verdi's opera which was staged at Luxor, Egypt, last year will be presented in the Olympic Stadium. For tickets: (800) 382-8080 or (514) 288-2525.

JUNE 23-OCTOBER 23, CHAGALL EXHIBIT, Montreal. About 150 works. The exhibit originates here, at the Musee des Beaux-Arts.

JULY 1-10, MONTREAL JAZZ FESTIVAL, Que. Some 1,000 musicians, from 15 countries and playing all styles of jazz, will perform, mostly along St. Catherine and St. Denis streets.

JULY 7-17, QUEBEC SUMMER FESTIVAL, Quebec City. The 20th staging of North America's largest francophone cultural celebration. (Many of the events are, however, presented in the international language of music.) Performers from Europe, Africa, and Latin America, as well as Canada and the U.S., will be featured.

JULY 14-24, JUST FOR LAUGHS FESTIVAL, Montreal. Did you hear the one about

the roster of comics from Australia, Belgium, France, and Italy, as well as Canada and the U.S.?

AUGUST 13-21, PLAYER'S CHALLENGE TENNIS TOURNAMENT, Montreal. The Canadian women's championship. To reserve tickets: (514) 273-1515.

AUGUST 18-21, NORTH AMERICAN HOT-AIR BALLOON CHAMPIONSHIP, St. Jean-sur-Richelieu.

AUGUST 19-30, WORLD FILM FESTIVAL, Montreal. The program will be available the week before the festival.

For information: Quebec Government House, 17 W. 50th St., New York, NY 10020-2201. (800) 443-7000 from the eastern U.S., or (514) 873-2015.

ONTARIO

APRIL 14-OCTOBER 16, SHAW FESTIVAL, Niagara-on-the-Lake. Shaw's *You Never Can Tell*, *Geneva*, and *Dark Lady of the Sonnets*, Priestley's *Dangerous Corner*, Barrie's *Peter Pan*, an adaptation of Youmans and Fields's *Hit the Deck*, Tolstoy's *War and Peace*, Granville-Barker's *Voysey Inheritance*, and Hart and Kaufman's *Once in a Lifetime*. All performances prior to May 25 are previews. For the program or tickets: (416) 468-2172.



VACATIONS IN CANADA

MAY 13-23, FESTIVAL OF SPRING, Ottawa. Admiring the city's millions of tulips is just the excuse. There's also outdoor music and entertainment, and, on the 22nd, the Flotilla, a parade of 50 decorated boats along the Rideau Canal, followed by fireworks.

MAY 19-JUNE 5, GUELPH SPRING FESTIVAL. The premiere of the jazz opera *St. Carmen of the Main* (based on the play by Michel Tremblay), and performances by the American Indian Dance Theatre and Montreal Danse, plus numerous concerts and recitals. For the program or tickets: (519) 821-7570.

MAY 7-OCTOBER 30, STRATFORD FESTIVAL. Six Shakespeare plays, plus Lerner and Loewe's *My Fair Lady*, an adaptation of Dumas's *Three Musketeers*, Eliot's *Murder in the Cathedral*, MacDonald's *Not About Heroes*, More, Heneker, Norman, and Monnor's *Irma La Douce*, Sophocles' *Oedipus*, and Sheridan's *Critic*. All performances prior to May 30 are previews. For the program or tickets: (519) 273-1600.

JUNE 16-AUGUST 28, DEGAS EXHIBIT, Ottawa. The first stop, of two, in North America for this ambitious retrospective, consisting of nearly 300 works in all media. At the new National Gallery of Canada (which opens May 21), designed by Moshe Safdie.

AUGUST 6-14, PLAYER'S TENNIS TOURNAMENT, Toronto. The Canadian men's championship. To reserve tickets: (416) 665-9777.

SEPTEMBER 15-OCTOBER 1, FESTIVAL OF THE ARTS, Ottawa. Including multimedia spectacles, performance art, a comedy week, art exhibits, and sculpture, studio, and architecture tours. For the complete program: (800) 267-0450.

For information: Ontario Travel, Queen's Park, Toronto, Ont., Canada M7A 2E5. (800) 268-3735 or (416) 965-4008.

MANITOBA & SASKATCHEWAN

MAY 12-15, KINSMEN BAND FESTIVAL, Moose Jaw, Sask. Some 70 marching, stage, pipe-and-drum, and brass-and-reed bands will march in the parade, and 100, plus 50 choral groups, will compete.

JUNE 7-11, WINNIPEG CHILDREN'S FESTIVAL, Man. Including performances by the Beijing Opera, the Australian Elizabethan Theatre Trust, and London's Theatre Centre—all in Kildonan Park.

LATE SEPTEMBER TO MID-NOVEMBER, POLAR BEAR MIGRATION, Churchill, Man. Each fall as many as 150 prowling polar bears, impatient for Hudson Bay to begin to freeze so that they can get out on the ice and hunt seals, pass near, or through, Churchill. The probability of sighting bears increases from 45 percent in September to nearly 100 percent in early November.

For information: Travel Manitoba, Dept. 7020, 155 Carlton St., Winnipeg, Man., Canada R3C 3H8. (800) 665-0040.

Tourism Saskatchewan, 2103 Eleventh Ave., Regina, Sask., Canada S4P 3V7. (800) 667-7191 or (306) 787-2300.

ALBERTA & BRITISH COLUMBIA

MAY 16-23, VANCOUVER CHILDREN'S FESTIVAL, BC. The world's largest event of its kind, with singers, dancers, mimes, and puppeteers from several continents.

JUNE 3-AUGUST 20, BANFF FESTIVAL OF THE ARTS, Alta. Britten's *Rape of Lucretia* and *Albert Herring*, ballets to Bach's *Concerto Barocco* and Stravinsky's *Jeux de cartes*, Garcia Lorca's *Blood Wedding*, orchestral and chamber concerts, and recitals. For the program or tickets: (403) 762-6300.

JULY 8-17, CALGARY EXHIBITION AND STAMPEDE, Alta. Canada's number-one rodeo, according to the Professional Rodeo Cowboys Association.

For information: Travel Alberta, 10025 Jasper Ave., Edmonton, Alta., Canada T5J 3Z3. (800) 661-8888 or (403) 427-4321.

Tourism British Columbia, Parliament Buildings, Victoria, BC, Canada V8V 1X4. (604) 387-1642.

NWT & THE YUKON

JUNE 17, MIDNIGHT SUN GOLF TOURNAMENT, Yellowknife, NWT. Teeing off at midnight, at the Yellowknife Golf Club. Night is day, the greens are sand, and ravens steal the ball.

JULY 1, YUKON GOLD-PANNING CHAMPIONSHIP, Dawson City. Residents compete in the eponymous competition; visitors compete for the Cheechako Award.

For information: TravelArctic, Yellowknife, NWT, Canada X1A 2L9. (800) 661-0788 or (403) 873-7200.

Tourism Yukon, P.O. Box 2703, Whitehorse, Yukon, Canada Y1A 2C6. (403) 667-5340.

■ The July 9 sailing of *Tauk Tours'* nine-day *Gulf of St. Lawrence Cruise on the M/V Illiria*, from Montreal to Quebec City, can be combined with visits to both the **Montreal Jazz Festival** and the **Quebec Summer Festival**, and the July 1 and 5 sailings with visits to one or the other. The 135-passenger *Illiria* will cruise from Montreal through the Saguenay River fjord to a whale-watching area off Anticosti Island, the Bonaventure Island Bird Sanctuary and the town of Perce, the Magdalen Islands, St. Pierre and Miquelon, Newfoundland's Gros Morne National Park, a whale-watching area off the Mingan Islands, and finally Quebec. \$1,890-\$2,570 includes accommodations, shore excursions, and all meals. 15 sailings June 11 to September 17 (half of them taking the itinerary in reverse). (203) 226-6911.

■ A "tundra buggy"—open enough to permit a good view, closed enough to prevent the bears from joining the passengers inside, and with special wheels suitable to the terrain—is the vehicle of choice from which to watch the **Polar Bear Migration**, near Churchill, Manitoba. *Travel Manitoba* maintains a list of outfitters that have these buggies and offer excursions into polar-bear country. A typical trip would involve one or two nights' accommodations, at \$25-\$30 a night, and a half-day tundra-buggy excursion, for \$25-\$30. Many visitors take the train up; round-trip fare for the one-and-a-half day Via Rail journey from Winnipeg to Churchill is \$215-\$360. (800) 665-0040.

■ The Northwest Territories *1988 Explorers' Guide*, free from TravelArctic (whose address and phone are given at left), suggests dozens of ways to soak up the **Midnight Sun**. The *Guide* lists more than 150 packages available from 57 expedition and tour operators—ranging from half-day fishing or sight-seeing excursions to two- and three-week photographic or canoeing expeditions, and ranging in price from under \$100 to almost \$10,000. A similar publication for Alaska and The Yukon, the *1988 Official Vacation Planner*, is available from the Yukon Visitors Association, 302 Steele St., Whitehorse, Yukon, Canada Y1A 2C5, (403) 668-3331.

■ For that matter, all the tourist boards named at left will happily send you information on tour operators or places to stay, including rates for special city weekend packages or other bargains available at given times of year.

These are but a few samples of vacations incorporating events listed in the Travel Planner; your travel agent will be able to make many additional suggestions. The prices given were current at press time and are per person, double occupancy. The tours and packages described offer options and include amenities beyond those mentioned here.



THE UNITED STATES

NEW ENGLAND

APRIL 18, BOSTON MARATHON, Mass. (617) 536-4100.

APRIL 20-MAY 15, "THE TALE OF LEAR," Springfield, Mass. An adaptation of *King Lear* by Tadashi Suzuki, the Peter Brook of Japan. At StageWest. (413) 781-4470.

APRIL 30-AUGUST 30, "RAMESESSE THE GREAT," Boston, Mass. From the Cairo Museum, an exhibit of 72 objects from the tombs and temples of ancient Egypt's 19th Dynasty. At the Boston Museum of Science. (617) 589-0250.

JUNE-SEPTEMBER, GREAT WOODS SUMMER FESTIVAL, Mansfield, Mass. Including Pittsburgh Symphony concerts July 11-August 7. (617) 339-2333.

JUNE 16-19, U.S. OPEN GOLF CHAMPIONSHIP, Brookline, Mass. Amateur and professional golfers, at the Country Club. (617) 566-0240.

JUNE 18-SEPTEMBER 4, BERKSHIRE SUMMER ARTS FESTIVAL, Mass.

June 18-August 27, Jacob's Pillow Dance Festival, Becket. Ballet, modern, and folkloric companies, and even ballroom dancers. The ever-popular Pilobolus will perform August 2-6; the "Splash Festival," August 9-21, will bring together 55 companies from all over the world. (413) 243-0745.

June 27-August 27, Berkshire Theatre Festival, Stockbridge. The 60th season of American plays. (413) 298-5536.

July 1-August 28, Tanglewood Music Festival, Lenox. The season will open with Seiji Ozawa conducting his Boston Symphony Orchestra in Beethoven's Ninth; it will close with a four-day celebration of Leonard Bernstein's 70th birthday, during which Bernstein will conduct. (617) 266-1492 or, after June 27, (413) 637-1940.

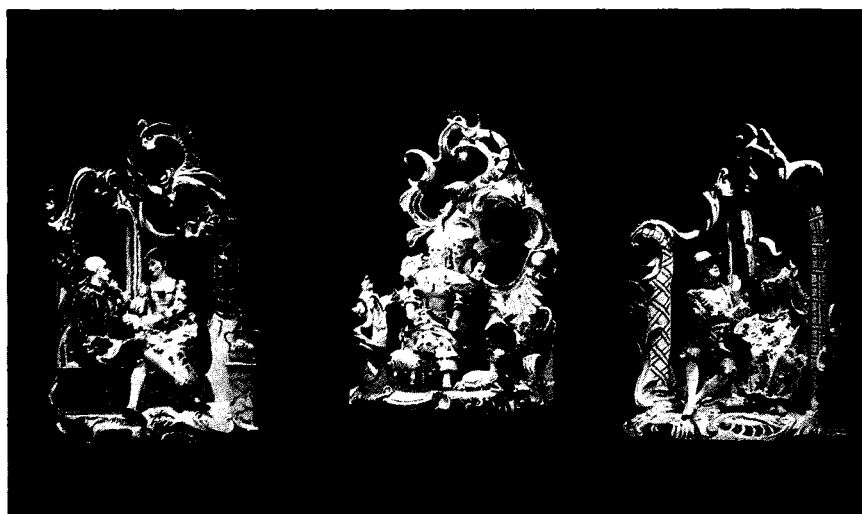
July 5-September 4, Shakespeare & Company, Lenox. Outdoor performances of *As You Like It*, *Love's Labors Lost*, and plays by Edith Wharton at The Mount, Wharton's mansion. (413) 637-1197 or, after June 1, (413) 637-3353.

July 6-August 21, The Music Theatre Group at Lenox Arts Center, Stockbridge. The premieres of two innovative musicals. (212) 924-3108 or, after June 15, (413) 298-9463.

July 23-August 7, Berkshire Festival Opera, Lenox. Glyndebourne-style evenings: the intermissions afford time for leisurely picnics. The company will perform works by Handel and Mozart. (413) 243-1343.

For information on all events: (413) 443-9186.

JULY 1-16, OLYMPIC SAILING TRIALS, Marblehead, Mass., and Newport, RI. Mar-



Live performers portray Meissen porcelains at the Pageant of the Masters, in Laguna Beach, California

blehead will host the trials for the Finn boat class, and Newport the Tornados, 470 men and women, Flying Dutchmen, and sailboards. (Trials for the other classes will be held, simultaneously, in San Diego.) (401) 849-5200.

JULY 11-24, NEWPORT MUSIC FESTIVAL, RI. The 20th season of chamber music and recitals in the mansions and landmarks of Newport. (401) 846-1133.

JULY 29-31, NATIONAL FOLK FESTIVAL, Lowell, Mass. The 50th edition of this roving multi-cultural festival (it's been held in 21 cities to date). The focus is always our nation's traditional arts—ranging from the Cajun to the Calabrian to the Cambodian. (617) 459-1000.

AUGUST 5-7, THE MAINE LOBSTER FESTIVAL, Rockland. (207) 596-0376.

SEPTEMBER 23-25, COMMON GROUND COUNTRY FAIR, Windsor, Maine. Mainstream and alternative technology, music, and food. (207) 622-3118.

SEPTEMBER 26-OCTOBER 1, NORTHEAST KINGDOM FALL FOLIAGE FESTIVAL, Walden, Cabot, Plainfield, Peacham, Barnet, and Groton, Vt. The six towns compete, genteelly, to give the best tours, mount the best exhibits, hold the best bazaar, and serve the best old-fashioned Vermont meals. (802) 563-2472.

OCTOBER 7-15, ULTIMATE YACHT RACE, Mystic and New London, Conn. One of three Ultimate series, for two categories of boats. \$1 million in prize money

will be divided among the top ten 30-foot unlimited-design yachts, and \$500,000 will go to the top ten J/24s. (817) 332-2431.

MID-ATLANTIC

THROUGH JUNE 12, "THE HUMAN FIGURE IN EARLY GREEK ART," Washington, DC. On loan from Greek museums, 67 marble, bronze, and terra-cotta sculptures and painted vases from the 10th to the 5th centuries B.C. At the National Gallery of Art. (202) 737-4215.

APRIL 13, NEW SWEDEN, Wilmington, Del. The first Swedish settlement in America was established 350 years ago. The anniversary (it's a tricinquagennial) will be celebrated in a number of locales this spring and summer, but nowhere more enthusiastically than in Wilmington, which is approximately on the site of that first settlement. King Carl XVI Gustaf and Queen Silvia, the Band of the Royal Swedish Army, a military-historical show troop, two Swedish ships, and a bronze cannon will all be present on April 13. Thereafter other exhibits will be mounted and visits made—notably a visit by folk performers and sports teams from Kalmar, June 15-19. (302) 571-4100.

APRIL 18-JUNE 6, AMERICAN BALLET THEATRE SEASON, New York City. Mikhail Baryshnikov's company will perform Monday through Saturday evenings, with Wednesday and Saturday matinees. (212) 477-3030.

APRIL 23, SHAKESPEARE'S BIRTHDAY CELEBRATION, Washington, DC. The

**United States**

one day of the year when the Folger Shakespeare Library hosts events for children and welcomes the adult public into the reading room, where the world's largest collection of first editions can be found. (202) 544-7077.

APRIL 24, NEW JERSEY WATERFRONT MARATHON, Jersey City, NJ. Serving as the Olympic men's trials. (201) 432-5530.

APRIL 26–MAY 15, AMERICAN MUSIC FESTIVAL, New York City. The New York City Ballet will perform. (212) 870-5570.

MAY 1, PITTSBURGH MARATHON, Pa. Serving as the Olympic women's trials. (412) 391-2800.

MAY 1–JULY 31, "THE ART OF PAUL GAUGUIN", Washington, DC. This traveling exhibit of more than 200 paintings, sculptures, ceramics, prints, and drawings will originate here, at the National Gallery of Art. (202) 842-6353.

MAY 5–JANUARY 8, PAUL KLEE EXHIBIT. Some 90 works, spanning the artist's career in its entirety. At the Metropolitan Museum of Art. (212) 879-5500.

MAY 14-21, PREAKNESS FESTIVAL WEEK, Baltimore, Md. The Preakness itself will be run on May 21. (301) 837-4636.

JUNE 3-19, THREE RIVERS ARTS FESTIVAL, Pittsburgh, Pa. Visual arts, including an exhibition of nine commissioned sculptures; and performances, including a new-music series, on six indoor and outdoor stages. (412) 481-7040.

JUNE 11, BELMONT STAKES, Elmont, NY. (718) 641-4700.

JUNE 11–JULY 11, NEW YORK FESTIVAL OF THE ARTS, New York City. The festival will open with Mikhail Baryshnikov's American Ballet Theatre performing Mark Morris's *Drink to Me Only With Thine Eyes*, Massine's *Gaite Parisienne*, and a new work by Clark Tippet. It will proceed with at least eight new American plays; O'Neill's *Long Day's Journey Into Night* and *Ah, Wilderness!*, with Jason Robards and Colleen Dewhurst; and Beckett's *Waiting for Godot*, with Dustin Hoffman and Nicol Williamson; and performances by the New York Philharmonic, the New York City Opera, the Merce Cunningham Dance Company, Pina Bausch's Tanztheater Wuppertal dance company, and Dance Theatre of Harlem. Also, a two-week jazz festival, a classic-film festival, children's theater, and heaven knows what else. 127 East 73rd Street, New York, NY 10021.

JUNE 15–SEPTEMBER, SARATOGA PERFORMING ARTS CENTER SEASON,

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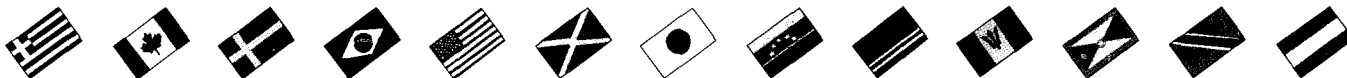
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United States

NY. Pop entertainers will be booked into the amphitheater between these engagements:

June 15-19, New York City Opera, performing Mozart's *Magic Flute*, Puccini's *Madame Butterfly*, and Lehar's *Merry Widow*.

July 2-3, Newport Jazz Festival-Saratoga. Continuous music from noon to midnight to noon.

July 5-23, New York City Ballet.

August 10-27, Philadelphia Orchestra. Before each concert, chamber music is presented beside Victoria Pool at Saratoga Spa State Park.

Among the bookings for the center's smaller theater is the Mark Morris Dance Group, August 15-20, performing one of its last engagements before it heads for Europe to become the National Ballet of Belgium.

For information on all events: (518) 584-9330.

JUNE 18-AUGUST 14, DAVID HOCKNEY EXHIBIT, New York City. A "mid-career retrospective," on the occasion of Hockney's 50th birthday, presenting 150 paintings, 60 drawings, and 30 photographs, prints, illustrated books, and samples of his work in stage design. At the Metropolitan Museum of Art. (212) 879-5500.

JUNE 19, CORESTATES CHAMPIONSHIP, Philadelphia, Pa. The world's richest single-day bicycling event, and the only World Cup race held outside Europe. (914) 937-2909.

JUNE 26-AUGUST 28, THE SEASON AT CHAUTAUQUA, NY. This lakeside Victorian community offers, by day, a challenging series of conferences and lectures by noted speakers, including Richard H. Rhodes, Albert Shanker, Letty Cottin Pogrebin, and Gloria Steinem this year. The evenings are given over to ballet, opera, and music by performers ranging from the resident orchestra to Gordon Lightfoot and Spyro Gyra. (716) 357-6200.

JULY 6-17, "THE TALE OF LEAR," Washington, DC. An adaptation of *King Lear* by Tadashi Suzuki, the Peter Brook of Japan. At the Arena Stage. (202) 488-3300.

JULY 21-24, U.S. WOMEN'S OPEN GOLF CHAMPIONSHIP, Baltimore, Md. Amateur and professional woman golfers, at the Baltimore Country Club. (301) 252-9813.

AUGUST 29-SEPTEMBER 11, U.S. OPEN TENNIS CHAMPIONSHIPS, Flushing Meadow, NY. At the USTA National Tennis Center, 128 men and 128 women will compete in a Grand Slam tournament. (212) 302-3322.

SEPTEMBER 4, NATIONAL FRISBEE FESTIVAL, Washington, DC. Said to be the world's largest non-competitive congress

of human and canine Frisbee-fingers, on the National Mall. (301) 843-1800.

EARLY OCTOBER-JANUARY 8, DEGAS EXHIBIT, New York City. The only stop in the U.S. for this ambitious retrospective, consisting of nearly 300 works in all media, will be the Metropolitan Museum of Art. (212) 879-5500.

OCTOBER 23-JANUARY 5, "JASPER JOHNS: 1974-1988," Philadelphia. The U.S. exhibit at this summer's Biennale in Venice, consisting of about 20 paintings and a similar number of drawings and prints, will return to the originating museum, the Philadelphia Museum of Art. (215) 763-8100.

NOVEMBER 6, NEW YORK MARATHON, NY. (212) 397-8200.



Pilobolus performs at Jacob's Pillow Dance Festival, in Becket, Massachusetts

■ SOUTHEAST

APRIL 22-MAY 1, NEW ORLEANS JAZZ AND HERITAGE FESTIVAL, La. Jazz, jambalaya, gospel, gumbo, brass bands, boudin, rhythm and blues, and turtle stew—that is, music and food of just about any style one might associate with New Orleans—are offered at the fairgrounds each weekend day, from late morning to sundown. Also, concerts are given in the evenings. (504) 522-4786.

APRIL 29-MAY 1, ROLEX KENTUCKY INTERNATIONAL EVENT, Lexington. These equestrian competitions in dressage, cross-country, and stadium jumping will serve as the finals for the U.S. Olympic team. (606) 233-2362.

APRIL 29-MAY 8, KENTUCKY DERBY FESTIVAL, Louisville. The Derby will be run on May 7. (502) 584-6383.

MAY 19-JUNE 5, SPOLETO FESTIVAL, Charleston, SC. The highlights include premieres of a dance work by Martha Clarke and of a musical, *The Warrior Ant*, by Breuer

and Telson. Also, Dvorak's *Rusalka* and Graun's *Montezuma*, and performances by Twyla Tharp Dance and Brussels's RTBF Orchestra. (803) 722-2764.

MAY 22, THE BIG SINGING, Benton, Ky. According to the National Music Council, this is the "oldest indigenous musical tradition in the United States": members of the community gather in the courthouse to sing 19th-century music a cappella, as they have done every year since 1884. (502) 527-8347.

JULY 18-24, HEMINGWAY DAYS FESTIVAL, Key West, Fla. Including arm-wrestling contests, a billfish tournament, a Hemingway look-alike contest, a short-story competition, and an annual presentation of journalism awards. (305) 294-4440.

AUGUST 6-28, BAL DE MAISON, Lafayette, La. The competition for Cajun bands. Sessions are held on the weekends only. (318) 232-3737.

AUGUST 27-SEPTEMBER 5, CHARLESTON STERNWHEEL REGATTA FESTIVAL, W.Va. The unusual climax to this event are tow-boat and sternwheeler races on the Kanawha River, on Labor Day. (304) 348-6419.

SEPTEMBER 10-18, ARTS FESTIVAL OF ATLANTA, Ga. Visual-arts exhibits plus music, dance, and theater on three stages, all in the 185-acre Piedmont Park. (404) 885-1125.

OCTOBER 1-JANUARY 31, "RAMESSES THE GREAT," Charlotte, NC. From the Cairo Museum, an exhibit of 72 objects from the tombs and temples of ancient Egypt's 19th Dynasty. At the Mint Museum. (704) 337-2009.

OCTOBER 7-9, NATIONAL STORYTELLING FESTIVAL, Jonesborough, Tenn. The nation's oldest (at 15 years old) and most prestigious storytelling festival. (615) 753-2171.

■ MIDWEST

THROUGH MAY 22, FREDERIC REMINGTON EXHIBIT, St. Louis, Mo. The first major retrospective of Remington's work: 50 paintings and 20 sculptures. At the St. Louis Art Museum. (314) 721-0067.

THROUGH JUNE 19, GEORGIA O'KEEFFE EXHIBIT, Chicago. A centennial exhibit, comprising more than 100 works. At the Art Institute of Chicago. (312) 443-3664.

APRIL 25-MAY 29, THEATRE FESTIVAL OF CHICAGO, Ill. About 20 produc-

**United States**

tions from around the world, including *Sophiatown*, by the Junction Avenue and Market theater companies, from Johannesburg; and the English Shakespeare Company's trademark series of the seven Royal Plays, performed in contemporary dress. (312) 664-3370.

MAY 21-JUNE 19, OPERA THEATRE OF ST. LOUIS SEASON, Mo. Colin Graham's company will perform Puccini's *Boheme*, Mozart's *Finta giardiniera*, Barber's *Vanessa*, and Weber's *Oberon*. (314) 961-0171.

JUNE 11, GRANDMA'S MARATHON, Duluth, Minn. (218) 727-0947.

JUNE 15-19, CLASSIC JAZZ AND RAG-TIME FESTIVAL, St. Louis, Mo. Aboard a showboat on the Mississippi, bands including Banu Gibson, of New Orleans; the Salty Dogs, of Chicago; the Jim Collum Jazz Band, of San Antonio; and the St. Louis Ragtimers will perform. (314) 621-3311.

JUNE 25-JULY 17, ANN ARBOR SUMMER FESTIVAL, Mich. Presenting the Count Basie Orchestra, Sarah Vaughan, Pilobolus, the Lar Lubovitch Dance Company, Marcel Marceau, and the premiere of Craig Lucas's *Reckless*, by the Circle Repertory Company. (313) 764-2538.

JULY 1-10, TASTE OF CHICAGO, Ill. The world's largest outdoor food and entertainment fair. (312) 744-3315.

JULY 13-AUGUST 6, VIENNESE SOMMERFEST, Minneapolis, Minn. The Minnesota Orchestra will give outdoor performances most evenings, and chamber groups and folk dancers will also be on the scene. (612) 371-5656.

JULY 16-OCTOBER 2, "THE HUMAN FIGURE IN EARLY GREEK ART", Kansas City, Mo. On loan from Greek museums, 67 marble, bronze, and terra-cotta sculptures and painted vases from the 10th to the 5th centuries B.C. At the Nelson-Atkins Museum of Art. (816) 561-4000.

JULY 17, GREAT AMERICAN CIRCUS PARADE, Milwaukee, Wis. Aside from a few innovations, such as the Ringling Bros. and Barnum & Bailey Living Unicorn®, the parade authentically re-creates the circus parades of the turn of the century, with antique circus wagons and stagecoaches, steam and air calliopes, marching bands, and lions and tigers and bears. (414) 271-7434.

JULY 28-30, BIX BEIDERBECKE MEMORIAL JAZZ FESTIVAL, Davenport, Iowa. Dixieland and other jazz on the banks of the Mississippi, in Beiderbecke's home town. (319) 324-7170.

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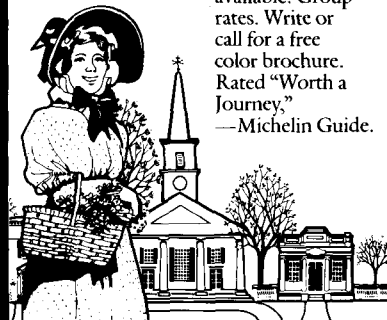
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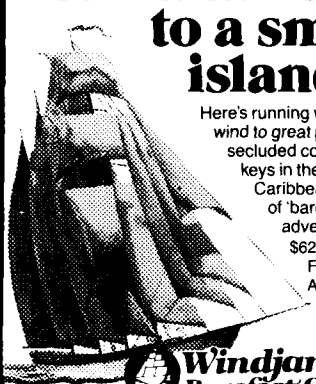
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SPECIAL ADVERTISING SECTION



United States

JULY 30-AUGUST 6, NATIONAL HOT-AIR BALLOON CHAMPIONSHIP, Indiana, Iowa. About 100 competing balloons and 100 spectating balloons are expected. The ascents will take place at 6 A.M. and 6 P.M. daily. (515) 961-8415.

AUGUST 11-14, PGA CHAMPIONSHIP, Edmond, Okla. The Professional Golf Association tournament will be held at the Oak Tree Golf Club. (405) 359-1988.

AUGUST 15-20, AMERICAN INDIAN EXPOSITION, Anadarko, Okla. The activities open with a parade and conclude with the crowning of the National War Dance Champion. In between, ceremonial-dance contests, greyhound and horse races, and arts and crafts exhibits are held. (405) 247-6651.

AUGUST 31-SEPTEMBER 4, CHICAGO JAZZ FESTIVAL, Ill. The world's largest free jazz festival. (312) 744-3315.

SEPTEMBER 7-DECEMBER 10, "THE ART OF PAUL GAUGUIN", Chicago, Ill. The inaugural exhibit in the Art Institute of Chicago's new South Building. This traveling exhibit of more than 200 paintings, sculptures, ceramics, prints, and drawings will meet up with the 85 etchings, lithographs, and woodcuts of "Gauguin and His Circle in Brittany," an exhibit that is otherwise traveling separately. (312) 443-3600.

SEPTEMBER 8-11, UNITED TRIBES POWWOW, Bismarck, N.Dak. Native Americans from several states and Canada will be competing in music and dancing, and selling food and crafts. (800) 437-2077.

OCTOBER 24-NOVEMBER 6, CHICAGO FILM FESTIVAL, Ill. (312) 644-3400.

WEST

MAY 6-15, ULTIMATE YACHT RACE, Corpus Christi, Texas. One of three Ultimate series, for two categories of boats. The winner in the 30-foot unlimited-design category will collect \$1 million in prize money, and \$500,000 will be divided among the top ten J/24s. (817) 332-2431.

JUNE 10-AUGUST 22, "TEXAS," Palo Duro Canyon State Park. Last year nearly 100,000 people, from 87 countries and all 50 states, came to see this musical drama on the theme of the history of the Texas Panhandle. It's presented on an outdoor stage (25 miles from Amarillo), with elaborate sound and light effects and props that include a real train and a windmill. (806) 655-2181.

JUNE 15-SEPTEMBER 15, "CARTHAGE: A MOSAIC OF ANCIENT TUNISIA,"

Houston, Texas. This exhibit, in honor of the 2,800th anniversary of the founding of Carthage, comprises 17 large pictorial mosaics, several heroic bronzes, Punic jewelry, 7th-century gold coins, and hundreds of other objects. At the Houston Museum of Natural Science. (713) 526-1763.

JUNE 16-19, TELLURIDE BLUEGRASS FESTIVAL, Colo. The 15th-anniversary edition, featuring dozens of the nation's finest players. (303) 728-3041.

JUNE 17-SEPTEMBER 5, FREDERIC REMINGTON EXHIBIT, Cody, Wyo. The first major retrospective of Remington's work: 50 paintings and 20 sculptures. At the Buffalo Bill Historical Center. (307) 587-4771.

JUNE 24-AUGUST 21, ASPEN MUSIC FESTIVAL, Colo. In its 40th-anniversary season the festival will present Mozart's *Don Giovanni*, Richard Strauss's *Salome*, and Verdi's *Falstaff*. There will also be a focus on Australian music. The full program and ticket information will be available in early May. (303) 925-3254.

JULY 1-AUGUST 27, SANTA FE OPERA SEASON, NM. In Santa Fe's unique open-air theater, Dan Duro's company will present Johann Strauss's *Fledermaus*, Mozart's *Così fan tutte*, Wagner's *Flying Dutchman*, Richard Strauss's *Feuersnot* and *Friedenstag* on a double bill, and the American premiere of Penderecki's *Black Mask*. (505) 982-3855.

JULY 10-AUGUST 22, SANTA FE CHAMBER MUSIC FESTIVAL, NM. An always surprising festival. Just to suggest its range: there will be a Baroque-music series, "Music of the Americas" performances by Joel Nascimento and the Brazilian Sextet, and a "Beethoven Plus" series, in which one performance, by the Mendelssohn String Quartet, will include works by Philip Glass and Jimi Hendrix, as well as Beethoven. (505) 983-2075.

JULY 23-31, CHEYENNE FRONTIER DAYS, Wyo. According to the Professional Rodeo Cowboys Association (which judges by prize money, as the cowboys also tend to do), this is the nation's number-one outdoor rodeo. (307) 778-7200.

JULY 31-OCTOBER 16, GEORGIA O'KEEFFE EXHIBIT, Dallas. A centennial exhibit, comprising more than 100 works. At the Dallas Museum of Art. (214) 922-0220.

AUGUST 11-14, INTERTRIBAL INDIAN CEREMONIAL, Red Rock State Park, NM. Near Gallup, 50 tribes from the Southwest and Mexico come together for parades, dances, a rodeo, and the selling of crafts and food. (505) 863-3896.



United States

AUGUST 16-21, COORS BICYCLE CLASSIC, Colo. The final seven (of 16) stages of America's premier bicycle stage race. The cyclists will race from one city to another each day. (303) 442-7300.

SEPTEMBER 2-5, TELLURIDE FILM FESTIVAL, Colo. Tickets will go on sale in late May, though the program will not be announced in advance of the festival. (603) 643-1255.

SEPTEMBER 3-17, GRAND CANYON CHAMBER MUSIC FESTIVAL, Ariz. The performances are held on the weekend evenings only, on the South Rim. (602) 638-9215.

SEPTEMBER 7-11, NAVAJO NATION FAIR AND RODEO, Window Rock, Ariz. The Navajos' traditional tribal fair, with dances, a big rodeo, and crafts and food. (602) 871-4417.

OCTOBER 1-9, ALBUQUERQUE BALLOON FIESTA, NM. The world's largest hot-air ballooning event, with more than 700 hot-air and gas balloons ascending en masse on the weekends. (505) 344-3501 or (800) 321-6979.

OCTOBER 16-JANUARY 8, FREDERIC REMINGTON EXHIBIT, Houston, Texas. The first major retrospective of Remington's work: 50 paintings and 20 sculptures. At the Museum of Fine Arts. (713) 526-1361.

PACIFIC

MAY 20-JULY 2, "THE TALE OF LEAR," Berkeley, Calif. An adaptation of *King Lear* by Tadashi Suzuki, the Peter Brook of Japan. At the Berkeley Repertory Theatre. (415) 845-4700.

MAY 27-30, DIXIELAND JUBILEE, Sacramento, Calif. Traditional jazz around the clock. Sixteen of the hundred-plus groups scheduled to play this year are from overseas—for example, the Neptune Jazz Band, of Zimbabwe. (916) 372-5277.

MAY 27-30, NORTHWEST FOLK LIFE FESTIVAL, Seattle, Wash. Some 750 dance and music groups will perform on 19 stages spread over 74 acres. The events include a Liar's Contest and a musical-instrument auction, among other whimsies of Americana. (206) 684-7300.

JUNE 28-JULY 4, MARUI O'NEILL WORLD TOUR EVENT, San Francisco. The penultimate competition on this world boardsailing tour. (808) 579-9765.

JULY 1-16, OLYMPIC SAILING TRIALS, San Diego, Calif. For the Soling (three-

man) and Star boat classes. (Trials for the other classes will be held, simultaneously, in Marblehead, Mass., and Newport, RI.) (401) 849-5200.

JULY 8-AUGUST 30, PAGEANT OF THE MASTERS, Laguna Beach, Calif. Local artists and craftspeople create life-size 3-D replicas of well-known artworks, and other residents step in—literally—to portray the figures in those paintings, statues, prints, porcelains, and so forth. The pageant, an aspect of the Festival of Arts of Laguna Beach, is presented each evening, with narration and live orchestral music, in an outdoor theater built specially for the purpose. (714) 494-1145.

JULY, WORLD ESKIMO-INDIAN OLYMPICS, Fairbanks, Alaska. The blanket toss, the arm pull, the Alaska high kick, the knuckle hop, and other traditional contests. (907) 452-6646.

JULY 22-30, ULTIMATE YACHT RACE, San Francisco, Calif. One of three Ultimate series, for two categories of boats. \$1 million in prize money will be divided among the top ten 30-foot unlimited-design yachts, and \$500,000 will go to the top ten J/24s. (817) 332-2431.

JULY 23-30, "SATYAGRAHA," Seattle, Wash. The Seattle Opera will give four performances of Philip Glass's opera in lieu of a *Ring* cycle this summer. The conductor will be Bruce Ferden, who conducted at the work's American premiere, in 1981. (206) 443-4700.

JULY 24-AUGUST 6, OLYMPIC BICYCLING TRIALS, Spokane, Wash. (303) 578-4581.

AUGUST 18-21, CONCOURS D'ELEGANCE AND MONTEREY HISTORIC AUTOMOBILE RACES, Pebble Beach, Calif. One of the nation's great vintage-car events. (408) 649-1770.

SEPTEMBER, AMERICA'S CUP, San Pedro Bay, Calif. New Zealand's Mercury Bay club's boat is offending, Sail America's *Stars & Stripes* defending. The date hadn't been set at press time. (619) 296-9224.

SEPTEMBER 16-18, MONTEREY JAZZ FESTIVAL, Calif. All styles of jazz. The program will be available in August. (408) 373-3366.

OCTOBER 22, IRONMAN TRIATHLON, Kailua-Kona, Hawaii. (808) 528-2050.

OCTOBER 29-NOVEMBER 26, ALOHA CLASSIC, Maui, Hawaii. The final event on the Marui O'Neill World Tour of boardsailing. (808) 579-9765.

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JULY 23–AUGUST 2, MID-SUMMER CARNIVAL, Antigua. Parades, calypso and steel-band shows, and, starting before sunrise on the next to last day, J'Ouvert, with steel-band music and dancing in the streets.

For information: Government of Antigua and Barbuda Dept. of Tourism, 610 Fifth Ave., New York, NY 10020. (212) 541-4117.

BARBADOS

MAY 27-29, CARIBBEAN JAZZ FESTIVAL. Including participants from various other islands and the U.S.

JULY 9–AUGUST 1, CROP OVER FESTIVAL. Parades, plantation fairs, food festivals, open-air concerts, and general celebrating, in honor of the sugarcane harvest. One highlight is the Cane Cutters' Spree, which takes place in a central plantation yard one evening. Another is the big parade for Kadooment, a national holiday, on August 1.

For information: Barbados Board of Tourism, 800 Second Ave., New York, NY 10017. (212) 986-6516.

BRITISH VIRGIN ISLANDS

JULY 23-24, BVI BOARDSAILING CHAMPIONSHIP, Trellis Bay, Tortola. A Johnny Walker Hook In & Hold On regatta.

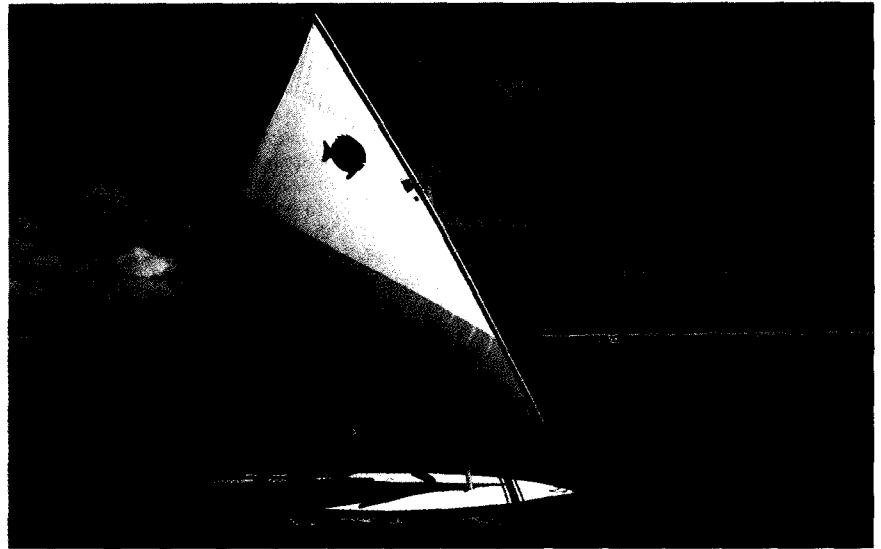
JULY 26–AUGUST 5, SUMMER FESTIVAL, Tortola. Steel-band and calypso contests, boat races, and a big parade on August Monday, August 1, the first of three public holidays in a row.

For information: British Virgin Islands Tourist Board, 370 Lexington Ave., New York, NY 10017. (212) 696-0400.

CAYMAN ISLANDS

APRIL 22-23, BATABANO CARNIVAL, George Town, Grand Cayman. The Caymans hold their big carnival *after* Easter, but Batabano is otherwise right in the mainstream, featuring a colorful parade, calypso and steel-band music, and dancing.

OCTOBER 22-29, PIRATES WEEK, Grand Cayman and Cayman Brac. When the pirates land and take over the islands, the festivities start: parades, fireworks, and sport-



Sailfish action at Aqua Action, in St. Lucia

ing and folk-cultural events. This is the biggest party of the year in the Caymans.

For information: Cayman Islands Dept. of Tourism, 250 Catalonia Ave., Coral Gables, FL 33134. (305) 444-6551.

FRENCH WEST INDIES

JULY 1-31, FESTIVAL OF FORT-DE-FRANCE, Martinique. An international potpourri of music, dance, and theater, with five performances each day.

AUGUST 13, FETE DES CUISINIERES, Pointe-a-Pitre, Guadeloupe. The local women cooks, including restaurant owners and chefs, all dress in their traditional best. They start the day at mass in the cathedral and then parade over to a large schoolyard nearby. There they make a party out of preparing an elaborate banquet, which visitors are welcome to attend.

For information: French West Indies Tourist Board, 610 Fifth Ave., New York, NY 10020. (212) 757-1125.

JAMAICA

JULY, NATIONAL DANCE THEATER OF JAMAICA SEASON, Kingston. During its brief season at home this internationally renowned folkloric company presents interpretations of everything from plantation dances to *obeah* rites.

JULY 18–AUGUST 3, 25TH ANNIVERSARY OF INDEPENDENCE CELEBRATIONS, Kingston. The events will include a National Festival Song Competition (in reggae) on the 18th, a Gospel Festival on the 19th, and a big parade on Independence Day itself, August 3.

MID-AUGUST, REGGAE SUNSPASH, Montego Bay. All-night concerts—probably five of them in a row—starring dozens of leading reggae artists.

For information: Jamaica Tourist Board, 866 Second Ave., New York, NY 10017. (212) 688-7650.

NETHERLANDS ANTILLES

APRIL 15–MAY 3, CARNIVAL, St. Maarten. There's a carnival village, stuffed with food and amusement booths. Also, a calypso contest; a "jump-up" parade on the morning of May 2; and the Grand Parade on May 3. As a finale, poor King Moumou gets burned every year.

For information: St. Maarten Tourist Office, 275 Seventh Ave., New York, NY 10001. (212) 989-0000.

PUERTO RICO

MAY 8-15, SEMANA DE LA DANZA, San Juan. Nightly performances of *danza* music

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■ With a *Cayman AirTours* vacation package for the Cayman Islands you can combine the exuberance of the *Batabano Carnival*, in April, or *Pirates Week*, in October, with the fascination of scuba diving. \$349-\$719 (a range that reflects the range of participating hotels and condo complexes on Grand Cayman and Cayman Brac) includes airfare from Miami or Tampa and seven nights' accommodations. For an additional \$40 a day certified divers may sign up for a dive package that includes unlimited airfills, the use of some equipment, and a two-tank boat dive; novices receive a discount on the "Discover Diving" program at participating dive shops. These packages are available April 16–December 14. (800) 247-2966.

■ Under the *Platinum Plan* offered by the *Elegant Resorts of Jamaica*, for stays of three nights or more, you may stay, and eat, at any combination of the six resorts on a visit to Jamaica. The Plantation Inn and Sans Souci, in Ocho Rios, and the Trident Villas, in Port Antonio, would be pleasant and plausible home bases from which to visit Kingston for a performance by the *National Dance Theater of Jamaica*, in July, or the *25th Anniversary of Independence Celebrations*, in July and early August. The Half Moon Club, Round Hill, and the Tryall Golf & Beach Club, in Montego Bay, nearer Negril, would be likelier places to rest up after the all-night concerts of *Reggae Sunsplash*, in August. About \$140-\$200 a day (a range that reflects the range of rooms and suites available at each resort, not different prices for different resorts) includes accommodations and all meals and drinks. Airfare, \$287 round-trip from Miami or \$458 from New York on an Air Jamaica APEX ticket for July or August, is additional. The packages are available April 16–December 14. (800) 237-3237 or (305) 666-3566.

■ Not only may up to two of a family's kids ages two to seven stay free at *Club Med-Eleuthera*, in the Bahamas, in June (when the club reopens after renovations), but also Eleuthera has a Mini Club to keep them amused during their stay. Sounds like a good excuse to drop by *Regatta Time* in Abaco, on nearby islands late in the month. For adults, \$949 includes airfare from New York (\$1,249 from Los Angeles or San Francisco), seven nights' accommodations, all meals, and all sports instruction and use of equipment. The charge for children eight to eleven is \$420 for the stay; children two to eleven pay 75 percent of the adult airfare. The younger kids may also stay free at Eleuthera in September and October; and at Club Med-Ixtapa, Mexico, in May, June, September, and October.

■ The *Island Vacation Catalog*, which *TourScan* publishes and sells by mail for \$3.50,

promises that it presents the best values available for the Caribbean, the Bahamas, and Bermuda. *TourScan* compares air-and-hotel packages offered by numerous sources, and then lists in the catalogue the least expensive three- and seven-night packages for each of nearly 1,000 hotels and resorts, on 49 islands. The summer/fall catalogue, which will list packages offered through mid-December, will be published in late May. *TourScan* is also a travel agency and can book the packages that appear in its catalogue. (800) 962-2080 or (203) 655-8091.

■ Some people consider spring the best antidote to fall. It will be bustin' out all over in San Antonio de Areco, on Argentina's *Day of Tradition*, in November. With an *American Express Great Cities* package, six nights' accommodations at one of three hotels in nearby Buenos Aires go for \$243-\$531. Round-trip APEX airfare is \$854 additional from Miami, \$903 from New York; and a week's Hertz car rental to get you to San Antonio de Areco and elsewhere costs \$380. Total price for an eight-day vacation for each of two people: \$1,287-\$1,624. The Buenos Aires package is available year-round. Another possibility from American Express is the November 1 departure of their nine-day *Rio-Buenos Aires Express* tour, plus a three-night extension in Buenos Aires. Here \$1,138-\$1,524 covers airfare from Miami, four nights' accommodations and four breakfasts in Rio, and five nights in Buenos Aires. This tour departs weekly, year-round. Call your local American Express travel agency for more information.

■ Some people, thinking about the fall, warm up to the idea of Belem, Brazil: at one and a quarter degrees south of the equator, it's right in the heart of eternal summer. *Portuguese Tours* will take you there for the *Cirio de Nazare* festival, in October. Combining their *Rio . . . The Uncharter* package, \$179-\$1,109 for six nights' accommodations and breakfast at one of seven Rio hotels, with their Belem package, \$149-\$189 for three nights and breakfast; round-trip APEX airfare from Miami, \$660, or New York, \$799; and a Varig Brazil Airpass II, for \$250, amounts to an 11-day Brazilian vacation for \$1,238-\$2,347. These and similar packages for other Brazilian cities and resorts are available year-round, though Rio prices vary according to the season. (201) 352-6112.

These are but a few samples of vacations incorporating events listed in the Travel Planner; your travel agent will be able to make many additional suggestions. The prices given were current at press time and are per person, double occupancy. Many of the tours and packages described offer options and include amenities, such as airport transfers and sightseeing excursions, beyond those mentioned here.



Caribbean

and dance at the 16th-century Dominican Convent.

JUNE 4-18, FESTIVAL CASALS, San Juan. Among the guests again this year will be the Washington, DC, Symphony.

NOVEMBER 15-29, FIESTA DE LA MÚSICA, San Juan. Classical music, dance, and a *cuatro* contest.

For information: Puerto Rico Tourism Co., 1290 Sixth Ave., New York, NY 10104. (212) 541-6630.

ST. LUCIA

MAY 21-23, AQUA ACTION, Rodney Bay. Competitions in just about every water sport you can think of.

For information: St. Lucia Tourist Board, 41 E. 42nd St., New York, NY 10017. (212) 867-2950.

TRINIDAD & TOBAGO

LATE SEPTEMBER-EARLY OCTOBER, STEEL-BAND COMPETITION, Port of Spain, Trinidad. The preliminary competitions last a week, the semi-finals a week, and the finals three days.

For information: Trinidad & Tobago Tourist Board, 400 Madison Ave., New York, NY 10017. (212) 838-7750.

U.S. VIRGIN ISLANDS

APRIL 18-23, CARNIVAL, St. Thomas. The first day of Carnival dawns—literally—to the tune of the steel and brass bands participating in the J'Ouvert Morning Tramp. The final two days feature parades, where Mocko Jumbi stiltwalkers walk, weave, and dance to the music.

JUNE 27-JULY 4, ST. JOHN CARNIVAL, Cruz Bay. Smaller than St. Thomas's carnival but no less festive. On July 4, besides concerts and fireworks, the entertainments include Mocko Jumbi stiltwalkers.

JUNE 30-JULY 4, CARIBBEAN BOARDSAILING CHAMPIONSHIP, St. Thomas. A Johnny Walker Hook In & Hold On regatta.

For information: U.S. Virgin Islands Dept. of Commerce, 1270 Sixth Ave., New York, NY 10020. (212) 582-4520.

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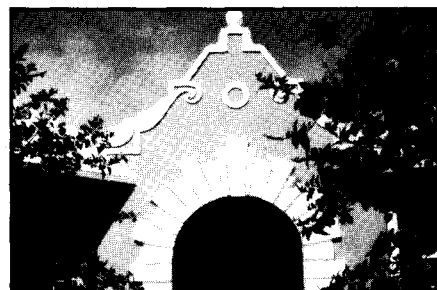


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THE BAHAMAS & BERMUDA

THE BAHAMAS

APRIL 27–MAY 1, FAMILY ISLANDS REGATTA, George Town, Great Exuma. The race for Bahamian work sloops is the highlight: the competition at sea is as fierce as the celebration on the harbor is friendly.

JUNE 23–JULY 4, REGATTA TIME IN ABACO. Five sailing races, in Hope Town, Marsh Harbour, Man-O-War Cay, Treasure Cay, and Green Turtle Cay.

For information: Bahamas Tourist Office, 150 E. 52nd St., New York, NY 10022. (212) 757-1611.

BERMUDA

APRIL 20, PEPPERCORN CEREMONY, St. George's. The Masonic Lodge of Bermuda has its headquarters at the State House, and when it comes time for the Lodge to pay the government its annual rent—namely, one peppercorn—the governor acts as rent collector, amid pomp and military fanfare.

MAY 1-7, RACE WEEK. Sailing competitions for four or five categories of vessels, including Sunfish and sailboards.

MAY 1-31, BERMUDA HERITAGE

MONTH. The highlight is Bermuda Day, a public holiday on Monday, May 23, which will be celebrated with a parade and dinghy races.

JULY 28-29, CUP MATCH, Somerset. This cricket match, pitting the eastern end of the island against the western, is such an important occasion that both days of it are public holidays. Further, the general ban on gambling is lifted to permit the Crown and Anchor tables to take wagers.

For information: Bermuda Department of Tourism, 630 Fifth Ave., New York, NY 10111. (212) 397-7700.

LATIN AMERICA

ARGENTINA

EARLY AUGUST, SKI FESTIVAL, Bariloche. Argentines think of Bariloche as St. Moritz South. Its week-long *fiesta* includes races and slalom and jumping competitions, and a lot of local color—such as a procession of torch-bearing skiers.

NOVEMBER 10, DAY OF TRADITION, throughout Argentina. The tradition in question is that of the gaucho, and it is celebrated enthusiastically with parades and folk-cultural events. San Antonio de Areco, a small town an hour's drive west of Buenos Aires, puts on one of the liveliest spectacles.

For information: Aerolineas Argentinas, Commercial Dept., 9 Rockefeller Plaza, New York, NY 10020. (212) 974-3300.

BELIZE

SEPTEMBER 4-10, ST. GEORGE'S CAYE DAY CELEBRATIONS. The highlight is a big street carnival on the final day—the anniversary of the Battle of St. George's Caye.

For information: Embassy of Belize, 1575 I St., NW, Washington, DC, 20005. (202) 363-4505.

BRAZIL

MAY 22, CALVALHADA, Pirenopolis. A tradition that originated in medieval Portugal and lives on in this small town west of Brasilia, Calvalhada is celebrated with jousting tournaments and entertainment by clowns and jesters.

JULY, WINTER FESTIVAL, Campos do Jordao. The region, near Sao Paulo, that

considers itself Brazil's St. Moritz South presents an annual music festival in a nature preserve in the Mantiqueira mountains.

OCTOBER 9-22, CIRIO DE NAZARE, Belem. On the first day of the festival a huge procession travels through the city to the Basilica de Nazare. This is the Amazon region's largest annual festival.

For information: Brazilian Government Trade Bureau, 551 Fifth Ave., New York, NY 10176. (212) 916-3206.

MEXICO

JUNE 2, CORPUS CHRISTI DAY, Papantla. Although the Totonac Indians now perform *El volador*, their flying pole dance, on Sundays year-round in homage to the tourist trade, this is the traditional time for it. Four brightly costumed dancers climb to the top of a pole in the town square, fall backward, and, suspended from ropes, "fly" around the pole 13 times.

JULY 18-26, GUELAGUETZA DANCE FESTIVAL, Oaxaca. *Guelaguetza* is a Zapotec word, meaning "gift," but it's not only Zapotec people who take part in the compendium of pre-Columbian dances presented twice, July 19 and 26 this year, during this festival. Each of the performances, on Fortin Hill overlooking the city, starts at 10 A.M. and continues for most of the day.

OCTOBER 1-31, OCTOBER FESTIVALS, Guadalajara. Concerts of medieval music, folk-dance performances, mariachi serenades, exhibits of art and pre-Columbian artifacts, equestrian events, a rodeo, a parade, and fireworks. The program will be available in August.

MID-OCTOBER–EARLY NOVEMBER, CERVANTINO FESTIVAL, Guanajuato. Orchestras, vocalists, guitarists, jazz groups, ballet and modern-dance companies, folk music and dance groups, visual artists, and theatrical companies, from both Americas, the Caribbean, and Europe. The program will be available in the summer.

For information: Mexican Government Tourist Office, 405 Park Ave., New York, NY 10017. (800) 331-1100.

PERU

JUNE 24, INTI RAYMI, Cuzco. The Inca Festival of the Sun is celebrated at Sacsahuaman, the fortress overlooking Cuzco. Richly costumed dancers and singers perform, and everyone drinks *chicha*, the local corn beer—all in the name of the solstice.

For information: Pertour International, 30 E. 42nd St., New York, NY 10017. (212) 682-0622.

VENEZUELA

JUNE 2, DEVIL DANCERS FESTIVAL, San Francisco de Yare. This small town near Caracas boasts the headquarters of the oldest devil dancers' society in the New World. For the festival the dancers dress in baggy red clothes to which crosses have been pinned, don grotesque, horned papier-mache masks, and carry rosaries. They dance in front of a church until dusk, when they retire to their headquarters.

For information: Venezuela Government Tourist and Information Center, 7 E. 51st St., New York, NY 10022. (212) 355-1101.

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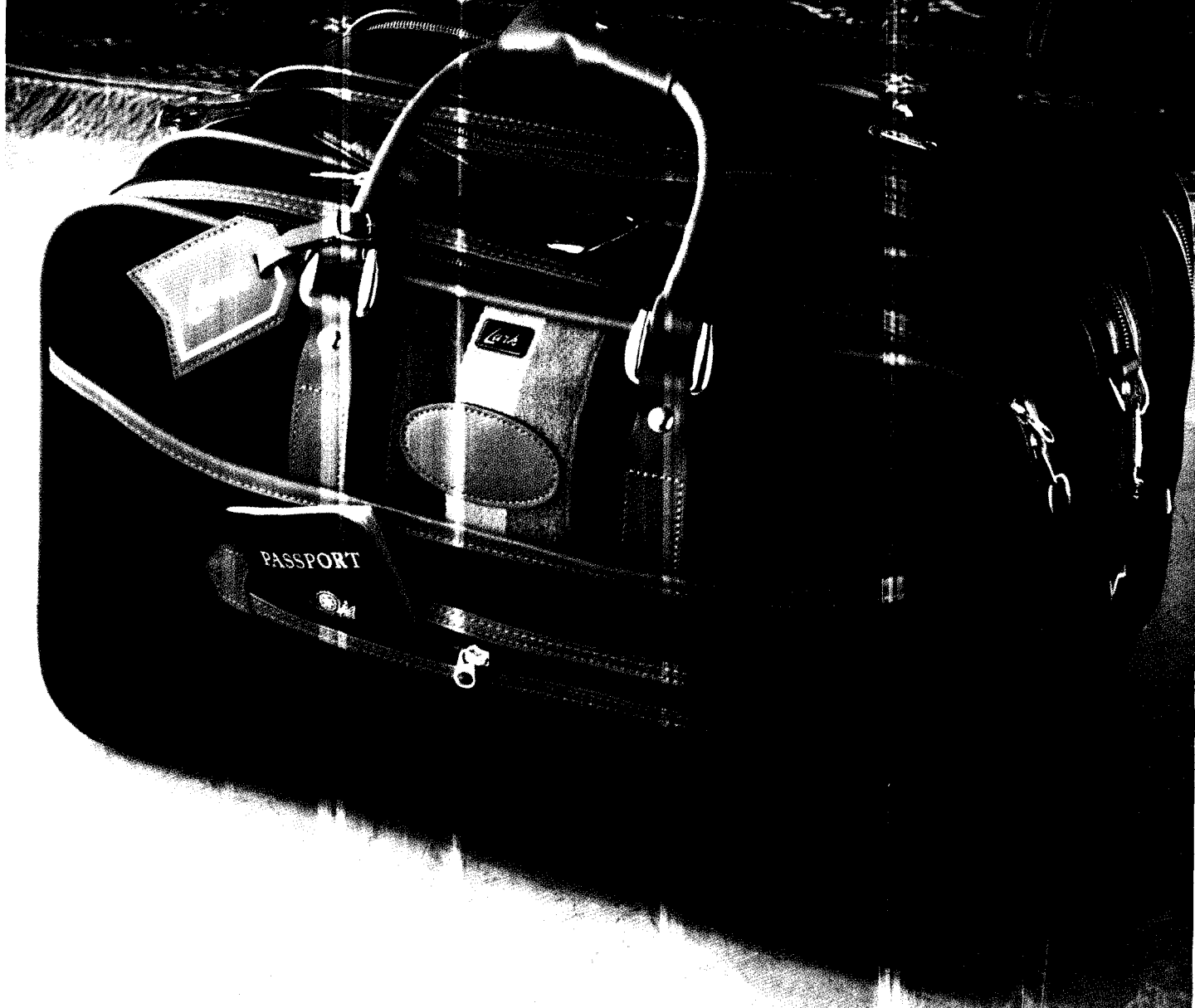
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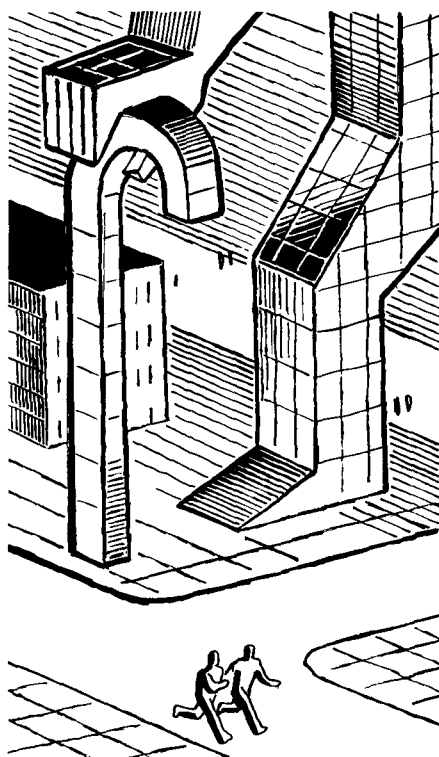
"Life-care" centers offer services for the elderly, often at a very high price

BY PHILIP LANGDON

IN RECENT YEARS builders, developers, and many others have been tantalized by visions of an aging America with plenty of money to spend. Though a fifth of the population sixty-five and older is poor or near poor, most elderly people have a considerably more comfortable style of life. The average after-tax income of the elderly is actually nine percent higher than that of the rest of the U.S. population, according to the Real Estate Research Corporation. Since 1962, when Michael Harrington's *Other America* was published, the median cash income of households headed by someone of retirement age has increased 75 percent in constant dollars. Thirty-one percent of America's elderly households have an annual income of at least \$20,000. In addition, nearly three quarters of retirement-age people own their own homes.

The result is that despite remnants of old-age subsistence living, a considerable number of the country's elderly can presumably sell their houses, collect their equity (averaging \$60,900 in 1985), and move into something better suited to their current needs. In reality most elderly people stay put. But the very knowledge that there are 30 million people sixty-five and older, many of them with sizable assets, is motivating a wide range of builders—from local companies to Cardinal Industries, the largest modular-housing manufacturer in the United States—to focus on retirement housing. If they do so, the housing choices offered to older people are expanding quickly. In no segment of what is called the senior-living industry is there now more diversification than in housing for the older elderly—people in their late twenties and up who need services that they didn't need at sixty-five. Across the country there are now several hundred "life-care" complexes, which guarantee housing and services to their residents for the rest of their lives, even if their health deteriorates markedly. One in Bloomfield, Connecticut, in the

rolling countryside north of Hartford, I visited an elaborate life-care complex named Duncaster. Moving into it is like buying a very expensive insurance policy. Life care is rarely for those with meager resources. The religious and nonprofit organizations that have built most of the nation's life-care communities (Duncaster was built by a nonprofit corporation) usually demand both a hefty entrance fee for the right to occupy an



apartment (not for ownership of it) and a substantial monthly charge. A person who moved into a one-bedroom apartment in a median-priced life-care development today would pay \$55,000 plus a monthly charge of \$740, according to Laventhol & Horwath, a Philadelphia-based accounting and consulting firm whose clients include developers of housing for the elderly throughout the United States.

Duncaster is near the top of the line and is priced accordingly. For a one-bed-

room unit, entrance fees start at \$77,935 and monthly charges start at \$1,699. A resident who stays no longer than three months can get back all of the entrance fee, but after that the potential refund declines each month; after forty months the entire amount belongs irrevocably to Duncaster. Many life-care complexes are experimenting with a variety of financial arrangements—some permanently offering full refunds, others 70 to 90 percent refunds—but a sliding scale that moves toward no refund at all is still commonplace.

In return for their money the residents of Duncaster's 216 apartments receive services that are typical of life-care developments—transportation, regular apartment cleaning, lunch or dinner every day in a group dining room, emergency medical attention at the pull of a cord in the apartment, and, if needed, unlimited care at no extra charge in a nursing center on the premises. Duncaster's higher-than-average costs are dictated by its lavish setting—seventy-two acres of woodland, grassy knolls, and ponds—and by the generous amenities it offers. Almost every life-care development offers a beauty salon, a doctor's office, and places for social activities, but Duncaster also has some less standard amenities, such as a bank branch, a professional-quality greenhouse, an auditorium, a woodworking shop, a library with a collection of large-print publications, and a complete suite for visiting physicians. There is even a "gentlemen's club," although three quarters of the residents of Duncaster are women. (Nationally, there are twice as many women as men who are seventy-five and over.)

Duncaster's buildings—gable-roofed three- and four-story structures in brick and a stucco-like material called Dryvit—are linked at such varied angles that from a distance they seem a jumble. As I drove down a winding entrance road, I wished that the designers, Stecker, LaBau, Arneill, of Hartford, had given the complex a more orderly configuration, like that, say, of the University of Virginia, where Thomas Jefferson artfully lined a central lawn with a series of connected buildings, making their organization clear and symmetrical, and the ensemble architecturally compelling.

A wish like this is in vain. The governing wisdom is that a life-care complex must not look institutional. Designers typically break big developments into smaller components, whose scale is

more nearly domestic, even if this produces a fragmented appearance.

The apartments at Duncaster, like those in many life-care complexes, have small kitchens, living rooms large enough for entertaining visitors, and private balconies or patios. Studio apartments are greatly outnumbered by one- and two-bedroom units, reflecting a general trend toward apartments with room for the furnishings and memorabilia that residents have accumulated over the years. As in a hospital, all of the common facilities and apartments are connected by enclosed, weather-protected corridors. "There's basically no place in the U.S. where a covered passage open on the sides is acceptable, because it's either too hot or too cold at some time of the year," says Carl H. Irwin, an architect in Huntington Beach, California, who is widely known for his work in retirement housing. The halls converge on a handsome courtyard ringed by the library, the dining room, the gentlemen's club, and other common facilities. Irwin advocates this kind of layout, with the activity areas clustered at the hub and the apartment corridors radiating outward, because it minimizes the walking that residents have to do.

NOT SURPRISINGLY, the reservations that elderly people have about life care often pertain to money. "On average, only one in four residents ever needs nursing care on a permanent basis, and the elderly don't necessarily want to subsidize someone else's bill," says James F. Sherman, a partner in Laveneth & Horwath. To lower prices and enhance the residents' sense of independence, many life-care complexes are gradually converting included services into options. Residents pay only for what they need.

At the same time, a growing number of for-profit companies are entering the older-elderly housing field, and many of them are eliminating both nursing care and the entrance fees that the elderly have always been reluctant to pay.

Some are offering condominiums that the resident or the resident's estate can later resell. Others are simply renting to elderly people. In these rental complexes (often called congregate living facilities), which offer residents such services as transportation, housekeeping, and one group meal a day, the median monthly cost is \$825 for a one-bedroom apartment. Though rental developments generally lack nursing care, many

of them help residents find a nursing home or hospital if their health deteriorates to the point where they have to leave.

The construction of rental projects is now booming, and that of entrance-fee developments is quiescent. Since 1982 Cardinal Industries, of Columbus, Ohio, has built seven rental retirement complexes, called Cardinal Villages, and has begun construction on six more. I spent a day at one of them—a rambling, low-slung wood-and-brick complex on just under ten acres in the Akron suburb of Cuyahoga Falls. The apartments there have small but complete kitchens, reasonably large living rooms, and private screened porches looking onto the grassy grounds. They also have a button for summoning emergency help and an "up-and-about" cord, which the resident is supposed to pull by 10:30 each morning; if it isn't pulled, a staff member checks to see if there's trouble. Corridors, which jog here and there to avoid monotony, connect the 119 apartments to the group dining room, beauty salon, combination library and game room, visiting-doctor's room, and other common facilities, most of which are clustered near the entrance. There is no nursing care, no greenhouse, no gentlemen's club. If the residents need an auditorium-sized area, they use the dining room. The result of these and other economies is that the rent is relatively low—\$799 a month for a one-bedroom unit, including transportation, weekly apartment cleaning (the trend in the industry is toward less-frequent cleaning), some social activities, and one meal a day.

Inside Duncaster is an air of reserve much like that of an established well-to-do neighborhood. A Cardinal Village is less polished, but the relatively compressed common areas seem more lively with conversation and card-playing; the people I talked to at Cuyahoga Falls seemed as cheerful, in a just-folks manner, as could be expected in a complex where the average resident is an ache-and-pain-prone eighty-three. After spending time at these two complexes and also seeing some depressingly blank faces in a congregate complex in Delray Beach, Florida, it was clear to me that although price, services, design, and amenities are important, what also greatly influences a resident's degree of satisfaction is the overall tone of the place—the degree of vitality and the attitudes of the other residents and the staff.

THERE IS A PROBLEM in fitting even the best of these forms of housing into large new developments that attract younger, still-vigorous retirees. "If you put congregate housing at the center of a development, it becomes symbolic of dependency and turns off the people who don't need congregate services," says David B. Wolfe, an authority on marketing housing for older people. A former land planner, he founded the National Association for Senior Living Industries and operates Wolfe Resource Group, in Annapolis, Maryland. Some retirement communities are trying to de-emphasize congregate and nursing facilities. When I visited Providence Point, 180-acre retirement community in Issaquah, Washington, I discovered that both the congregate housing I was looking for and a nursing home had been built just outside the development boundaries, each under the auspices of an organization independent of Providence Point. Prospective buyers of Providence Point's "empty-nester" condominiums inevitably learn that congregate housing and nursing care are close by—and available if they need either of them later—but this is not emphasized. The salespeople, according to Wolfe might say, "Oh, by the way, if you want your mother to move in, there's a nursing home over there." It's done in an off-handed, oblique manner." Wolfe argues that one of the chief rewards of any discretionary purchase is the pleasure of being well thought of. In housing, Wolfe says, key questions in people's minds are "Will my friends see my choice in an unfavorable light? Will they think that I'm moving to a retirement community I'm not what I used to be?"

Wolfe is involved in two retirement age communities—both just beginning construction—that will apply his theories about designing with "social reinforcement" and self-esteem in mind. One is Friday Mountain, a 550-acre development southwest of Austin, Texas, planned by Andres Duany and Elizabeth Plater-Zyberk, of Miami. The other is Worman's Mill, a 224-acre project in Frederick, Maryland, designed by Wayne Williams, of the Smith-Williams Group, of Los Angeles and Washington, D.C.

"The congregate care at Friday Mountain is planned as a three-story facility that will look like an old-fashioned hotel, near a square in the center of town," says Walter Reifslager, the chairman of Whitehawk Development Corporation.

which, in partnership with Swanson-Dean Company, is developing Friday Mountain as a traditional small town containing housing, opportunities for employment, and a population composed mostly but not entirely of people over fifty. "Because of the facility's location," he says, "people can venture out and eat at other places." The small-town format is expected to act as a kind of camouflage, making the congregate care less conspicuous and thus reducing the stigma attached to it. In a traditional town, David Wolfe says, people expect to encounter diverse kinds of buildings and activities, and are not put off by such things as businesses and nursing homes, as they likely would be in a suburban-style development. At Worman's Mill, which is also conceived in terms much like a turn-of-the-century town, with a mostly retirement-age population and opportunities for work, there will be a permanent-residence hotel," says the developer, Robert K. Wormald. "We won't call it congregate." Whatever it is called, the hotel will have many of the same elements as congregate complexes, including rooms with small kitchens and access to services such as health monitoring and food delivery, which will also be available throughout the development.

The four-story hotel at Worman's Mill will have a restaurant on the ground floor, facing a town square. The expectation is that people from throughout the community will eat there at least occasionally. Indeed, Wolfe argues, attracting outsiders into the building that houses somewhat dependent elderly people is critical to the elderly's self-esteem. "It validates it as a desirable place to live," he says. Residents, he says, draw satisfaction from knowing that the place they call home has an appeal for those who don't live there, including younger people.

The advantages of Friday Mountain and Worman's Mill, if they work as planned, lie in integrating the elderly to a more natural, balanced community. These developments aim to overcome the separateness that plagues most housing for the elderly—a separateness that deters most retired people from considering living in such places. "Everybody I know who's older doesn't want to go into what's available," Wormald says. "What people want," Wayne Wilms says, "is to be able to avail themselves of more services but not remind themselves that they're getting old." □

Answers to the March Puzzles

"WORD SQUARE"

Across. 1. AFFOREST 6. WOMAN (NOW rev.) 10. BELIEF 11. KIDMON-O (monk anag.) 12. ORIEL (homoph. of *oriole*) 13. LISTENED (teens anag.) 14. CYPRESS 16. TOFU (hidden) 17. THIS (anag.) 20. A-TO-P 21. PAST 24. BIRD (homoph.) 26. NINA (rev.) 28. SMELLED 32. SAGUAROS (Ross anag.) 33. (o)DE-COR(n) 34. E-THANE 35. PARADE 36. SET ON (rev.) 37. (SEA) MILES
Down. 1. ABOUT (rev.) 2. FEVER 3. FLIP-FLOP 4. RE(ally) 5. S(T)IR 6. W(a)ITS 7. MONTH 8. ANEMIC (rev.) 9. NODOSITY (anag.) 14. CUSPID'S 15. STIPEND 18. IAMBUSES 19. MANIACAL (anag.) 22. PIRATE 23. ENCODE (need anag.) 25. RIGHT (homoph.) 27. ACRES 29. MANN (hidden) 30. LOVE (hidden rev.) 31. EDAM (rev.)
Word Square. a. ADORE b. HERON c. CREDO (anag.) d. R-OVER e. MARCH (double def.)

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MUSIC

BORN OUT OF TIME

Wynton Marsalis and his contemporaries recapitulate modern jazz

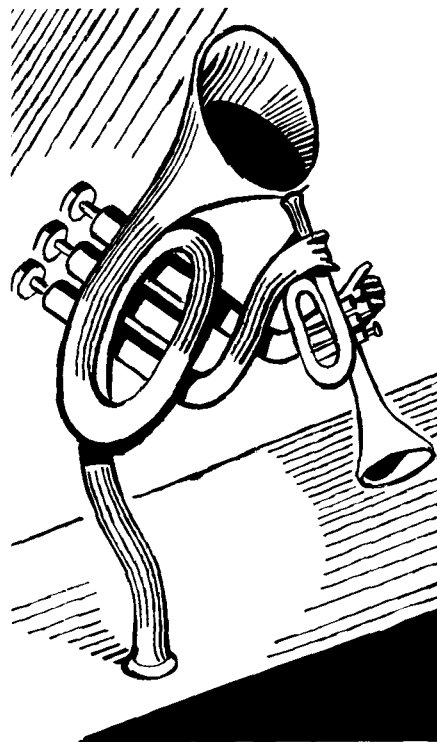
BY FRANCIS DAVIS

JUST EIGHTEEN WHEN he made his debut with Art Blakey's Jazz Messengers, the trumpeter Wynton Marsalis answered the prayers of those who feared that the clock was running out for jazz, as it clearly already had for the blues. Most of the surviving heroes of swing and bebop were in decline, and the prevailing wisdom was that no successors were in the wings. But here was an immensely gifted musician still in his teens who played straight-ahead jazz, rather than funk or fusion. That he was a black second-generation jazzman (the son of the obscure pianist Ellis Marsalis) from New Orleans, the city generally acknowledged to be the birthplace of jazz, was taken as an especially good omen.

This was in 1980, and Marsalis has since achieved a celebrity rare for a contemporary jazz musician, partly as a result of his parallel career in classical music. At twenty-six he is no longer a prodigy. He is now four years older than Miles Davis was when he recorded the first of his classic nonet sessions, two years older than Clifford Brown was when he recorded "Jordu" and "Joy Spring." It is time to ask if Marsalis has fulfilled his potential, what his influence has been on musicians his own age and younger, and whether he has expanded the audience for jazz, as many hoped that he would.

The answer to the first question is a qualified yes. With his chill tone and jabbing attack, Marsalis still echoes Miles Davis, just as he did eight years ago with Blakey. Moreover, now that Marsalis leads his own band, he takes his cues from the quintet that Davis led from 1964 to 1967, which included the pianist Herbie Hancock, the bassist Ron Carter, the drummer Tony Williams, and the saxophonist Wayne Shorter (who is still the primary role model for Marsalis's brother, the saxophonist Branford Marsalis, older than Wynton by one year and a former member of his group). Yet Marsalis has made progress in finding a voice of his own. There is a sly wit

to his half-valve work that owes nothing to Davis, although it does recall the veteran trumpeter Clark Terry, one of Davis's early influences. Another sign of Marsalis's enhanced individuality is the way he has zeroed in on the most provocative aspect of the Davis Quintet's music from the middle sixties: its circling, now-you-hear-it-now-you-don't approach to the beat.



Marsalis is one of very few jazz musicians able to line up enough work to keep a band together full-time, and his rapport with his rhythm section on the recent *Marsalis Standard Time—Volume 1* (Columbia FC-40461) attests to the virtues of stability in personnel. There are moments when Marsalis, the pianist Marcus Roberts, the bassist Robert Leslie Hurst III, and the drummer Jeff Watts sound as though they were playing in four different time signatures. But actually they are stretching a basic quadruple meter four different ways, accenting

different beats in every measure, and trusting that the listener will feel the downbeat in his bones. The effect is mesmerizing, and it would be beyond the ken of a group hastily assembled for a recording date.

Marsalis Standard Time—Volume 1 is the first of Marsalis's albums (discounting a best-forgotten 1984 encounter with strings) to be mostly given over to vintage pop songs of the sort that provided excellent vehicles for improvisers from Louis Armstrong to John Coltrane but that too many younger musicians have rejected in favor of their own compositions. The album is a reminder of the outstretched hand that such songs have long offered to audiences trying to find a point of entry into jazz. Although the reckless tempos frequently reduce the melodies to unrecognizable blurs, the hint of familiarity left in the standards "Caravan," "April in Paris," "Foggy Day," "The Song Is You," and "Autumn Leaves" brings the Marsalis quartet's rhythmic cunning into a sharp focus lacking in his other albums.

The two songs on the album that are Marsalis originals—a fleet blues and an almost motionless ballad—seem out of place, not because they are intrinsically unworthy but because they are not subjected to as many rhythmic variations as the standards. "Memories of You," a solo feature for Roberts, begins promisingly, with wrinkled blues shadings and Thelonious Monk-like rhythmic hesitations, but falters as a result of Roberts' attempt to cram the entire history of jazz piano, from stride to free, into one three-minute performance. There are two versions of "Cherokee," both taken at a tempo considerably less punishing than the one that Charlie Parker set when he reharmonized the song as "Ki Ko," in 1945, but punishing enough to tongue-tie Marsalis. He redeems himself, however, on a lovely interpretation of Benny Goodman's old sign-off theme "Goodbye" and a straightforward reading of "New Orleans" that comes across as a modernist's heartfelt tribute to Louis Armstrong.

THE QUESTION OF Marsalis's influence is tricky. Even without him, musicians in their twenties might be looking back two decades for inspiration, to the period before John Coltrane's death, in 1967, and the gradual defection of Miles Davis and his sidemen to high-tech funk—the last time when there was anything approachin

general agreement on what constituted the state of the art. But inasmuch as Marsalis's emergence identified this anachronistic impulse as a movement, such subsequent arrivals as Branford Marsalis, the alto saxophonist Donald Harrison, the drummer Marvin "Smitty" Smith, and the trumpeters Terence Blanchard and Wallace Roney are Wynton's children.

Despite his large stylistic debt to Wayne Shorter, Branford Marsalis once seemed the most promising of these young musicians, but he has failed to deliver. His mastery of his instrument is impressive, and so is his grasp of jazz history. Called on to evoke Ben Webster's burly savoir faire in "Take the 'A' Train," on Mercer Ellington's *Digital Duke* (GRP GR-1038), Marsalis performs the task admirably. But *Renaissance* (Columbia FC-40711), his own most recent album, suggests that his ability to mimic different styles is not necessarily an asset. Each of his phrases seems to be enclosed in quotation marks: not only Wayne Shorter but "John Coltrane," Sonny Rollins, and "Joe Henderson," too. All that is missing is "Branford Marsalis."

Donald Harrison and Terence Blanchard are from New Orleans, like the Marsalis brothers, whom they succeeded in the Jazz Messengers. The recent *Crystal Stair* (Columbia FC-40830) is typical of the four albums they have made as co-leaders of their own group since 1983. The level of musicianship is high, and there is as much rhythmic detail and acceleration of tempo as on *Marsalis Standard Time—Volume 1*, but Harrison and Blanchard lack Wynton Marsalis's command of dynamics, and the result is that each track is indistinguishable from the one before it. The Marsalis brothers are the models for Harrison and Blanchard, which means that *Crystal Stair* sounds like the 1965 Miles Davis Quintet twice removed. On *Eric Dolphy and Booker Little Remembered Live at Sweet Basil* (ProJazz CDJ-640, available only as a compact disc with a companion cassette of the same material), Harrison and Blanchard are cast in the roles of the two late musicians, who were among the most individualistic in jazz. The other participants in this 1986 New York club session are the pianist Al Waldron, the bassist Richard Davis, the drummer Ed Blackwell, all re-creating the roles they played on the original Dolphy and Little recordings, recorded at the Five Spot in New York in

1961. Although Blanchard is out of his depth trying to capture Little's melancholy, Harrison surprises the listener with searing improvisations that are satisfying in their own right, if too conventional in pitch to evoke Dolphy.

Marvin "Smitty" Smith, once the drummer in the Harrison-Blanchard group, makes his debut as a leader with *Keeper of the Drums* (Concord Jazz CJ-325), an album that owes much of its vibrancy to Smith's savvy in recognizing the individual abilities of the members of his ensemble—Wallace Roney, the trombonist Robin Eubanks, the pianist Mulgrew Miller, the bassist Lonnie Plaxico, and the saxophonists Steve Coleman and Ralph Moore—and his allocation of solo space in a way that shows each off to best advantage. Coleman's angular phrasing is well suited to the Dolphy-esque "Miss Ann," for example, and the sanctified call-and-response patterns of "The Creeper" are custom-made for the blues-based styles of Roney and Miller. Roney's *Verses* (Muse MR-5335), which benefits from Tony Williams's tidal-wave drumming, is more of a blowing date, and this proves to be an advantage on "Slaves" and the title track, two themeless blues with crescendoing solos by Roney, Miller, and the tenor saxophonist Gary Thomas. But on the remaining tracks, including the Miles Davis–Bill Evans composition "Blue in Green," these three soloists adhere too timidly to the guidelines set by Davis, Evans, and Coltrane in 1959 on the famous original.

ON ALL THESE recent albums rhythm is secondary to pulsation, and harmony is frequently suspended in the interest of mood. In that sense these albums recall those Miles Davis made for Columbia in the middle sixties and those his sidemen made for Blue Note during the same period, with a stable of like-minded musicians that included the vibraphonist Bobby Hutcherson, the trumpeter Freddie Hubbard, and the tenor saxophonist Joe Henderson. What gave the Blue Note albums urgency was their moderation while a revolution was going on elsewhere in jazz, in the more iconoclastic music of Coltrane, Ornette Coleman, Cecil Taylor, Albert Ayler, Sun Ra, and Archie Shepp.

These newer records convey an urgency, too, but it is the urgency of fighting the clock, of insisting that there is still adventure to be found in a twenty-year-old style of jazz that represented a



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cautious retreat even when new. It is not surprising that the musicians, in their twenties, are finding a ready audience among lifelong jazz fans at least a decade older. Nostalgia for the recent past is a widespread vice, catered to by the very technology that was supposed to hurl us into a future from which there would be no looking back. The new ghosts in the machine include oldies radio, television reruns, vintage films on video cassette, and Beatles and Motown reissues on compact disc (a format still so expensive that consumers feel safer sticking with the tried and true). But nostalgia is a vice to which jazz fans are especially susceptible. In the late 1960s Bob Dylan and the Beatles won for rock-and-roll more intellectual cachet than jazz had ever enjoyed, and both rock and rhythm-and-blues supplanted jazz as music for hedonistic release.

For many listeners, New Age music now serves as the backdrop for meditation that Coltrane and Pharoah Sanders once provided. It's been a long time, in other words, since a passion for jazz was regarded as hip rather than quaint. So a yearning for a time when Miles Davis was a trend-setter both musically and sartorially is understandable, even among those too young to remember such a time firsthand.

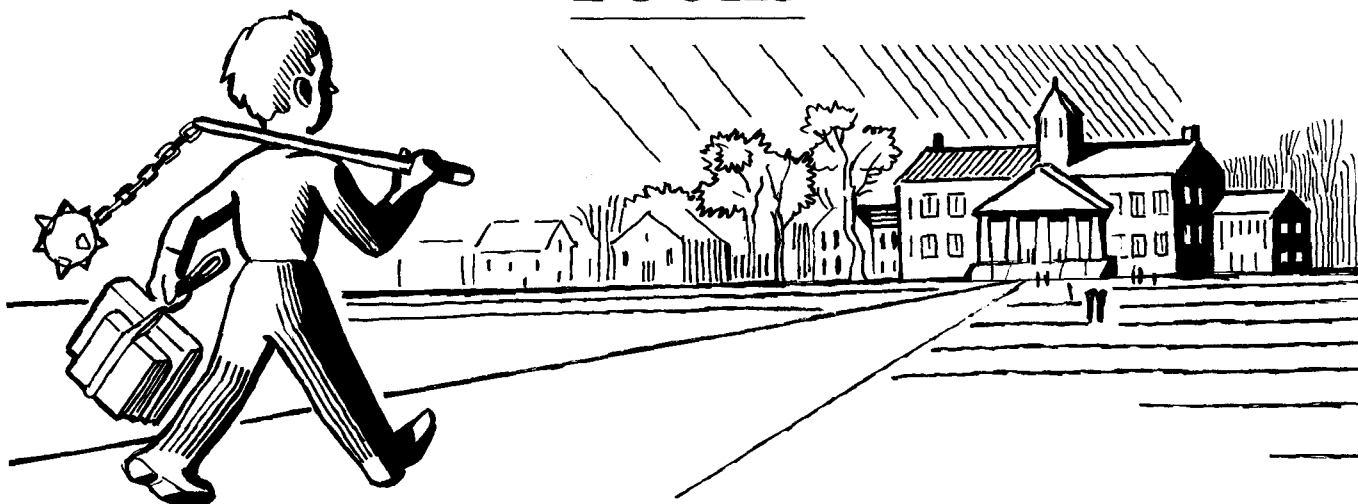
The underside of this nostalgia is a widely felt anger that discounts the onslaught of rock in order to put the blame on jazz for its own banishment from mainstream culture because of its excesses after 1965. Wynton Marsalis gives voice to this animosity in statements like this one, from a recent interview with the critic Leonard Feather: "When you come to New York, there's a whole school of musicians who are called the avant-garde, and you don't really [need] any craft requirements to join their ranks. All you have to do is be black and have an African name. . . ." Were it not for the fact that he has no past deeds of his own to recant, Marsalis could be the spokesman for the jazz auxiliary of Second Thought, the coterie of *mea-culpa*-ing former radicals turned neo-conservatives. Although Marsalis has expressed admiration for Ornette Coleman, the erosion of standards in the avant-garde is a recurring theme in his interviews, and because he neglects to name names, he tars all of Coleman's progeny with his brush. "It's much, much easier to whip up this hasty, fast-food version of innovation than to humble yourself to the musical logics that were thoroughly in-

vestigated by [the] masters," he recently complained to Stanley Crouch, once an avant-garde drummer and firebrand poet but now the jazz critic most in sympathy with Marsalis's reactionary aesthetic.

A good many jazz listeners agree with Marsalis, and much of what he says has the ring of truth. "Just to think of the arrogance behind a statement like 'I play world music . . .,'" he told Feather. "You're admitting that you're giving non-specific, second-hand treatment to different types of music. . . ." The avant-garde's naive fascination with ethnic music is worthy of Marsalis's ridicule. But it is good to remember that in addition to toying with African thumb piano and doussn' gouni and didjeridoo, the avant-garde restored clarinet and tuba to the jazz ensemble, to say nothing of importing such suspect "concert" instruments as violin and cello, thus relieving the inherent monotony of trumpet, saxophone, piano, bass, and drums (the lineup still generally favored by Marsalis and his followers). It was also such nominal avant-gardists of the 1970s as Roscoe Mitchell, Joseph Jarman, Muhal Richard Abrams, Anthony Braxton, Anthony Davis, and Henry Threadgill who rekindled interest in composition by avoiding theme-solos-theme formats, and who put jazz back in touch with its pre-Charlie Parker heritage by reinvestigating ragtime, marches, Duke Ellington, Fletcher Henderson, and Jelly Roll Morton.

There is no way to turn back the clock on all that has happened in jazz over the past two decades, nor should we want to try. To his credit, Marsalis has brought new audiences to jazz, although the critic Steve Futterman is not the only one who wonders if all that Marsalis has accomplished is to persuade "his upscale audiences that jazz could be as boring as they'd always secretly feared." Those of us who are more familiar with the rich diversity of contemporary jazz know that boredom isn't an issue so long as the music keeps evolving. Still, it should give anyone pause to consider that all of the most intrepid jazz experimentalists are now in their forties or older, while the leading musicians under thirty see themselves as craftsmen making small refinements in a time-tested art. Progress is frequently a myth in jazz, as in most other aspects of contemporary life. But it is a myth so central to the romance of jazz that the cost of relinquishing might be giving up jazz altogether. □

BOOKS



HIGH SCHOOL CONFIDENTIAL

BY NICHOLAS LEMANN

THE WORLD WE CREATED AT
HAMILTON HIGH 1953–1987

by Gerald Grant.

Harvard University Press, \$24.95.

THE BRAND OF conservatism that became politically dominant in this country when Ronald Reagan was elected President revolves around the idea that in the sixties liberals took over a perfectly good and happy America and, in the name of correcting a lot of lumpy problems, nearly ruined everything. As a fable, sixties revisionism is a powerful appeal, but many of the specific examples given in support of it have to be taken on faith—for example, the idea that détente and insufficient defense spending made us an international weakling.

The story that Gerald Grant tells here, though, makes an almost perfect real-life case study of the destruction by liberals of the peaceable kingdom of the fifties. Following social-science etiquette, Grant—a professor of education and sociology at Syracuse University—tells the school that is his subject Hamilton High School, in Median, U.S.A., where it's really Nottingham High, in Syracuse, New York. It opened in 1953 in a middle-class residential neighborhood, and its early years were ones of high achievement and social conformity. By the beginning of the seventies there were policemen in the hallways and

pimps operating on the school grounds. The principal had a full-time bodyguard; his predecessor had had his skull fractured during a race riot in the cafeteria. School closings due to violence and threats of violence were a regular occurrence. Student test scores were dropping dramatically, and nearly three quarters of the corps of teachers had left the school over a five-year period.

These problems were directly attributable to liberal reforms—mainly desegregation, but also a series of changes designed to confer upon students the same legal rights that adults have. Schools, Grant says, have always been “the means of creating social change through improving the opportunities for the next generation rather than consummating radical reform in the present generation.” This view of schools as social meliorist institutions sounds gentle, but the result, for Hamilton and many other high schools, was utter chaos in the short run and a kind of fundamental loss of compass in the long. Public schools change, and turn over their populations, so quickly that they tend, as Grant points out, to have little sense of their own history. A detailed account of one school over a generation, like this one, is rare and, because it makes Hamilton's change for the worse so plain, somewhat shocking.

In recounting a story that would have lent itself well to easy moral indignation, Grant is admirably restrained. He communicates a true commitment not only to the well-being of Hamilton High but also to the necessity of desegregation—there is not a hint of the feeling that if we would just return to the race relations of the fifties, everything would be all

right. In fact, he is optimistic about race—almost jarringly so, given what one is used to reading on the subject these days. By the early eighties at Hamilton High, Grant flatly declares, “the racial hostilities between whites and blacks had dissolved.” The “class couple” in the 1982 yearbook was interracial. The SAT scores of blacks at Hamilton, which fell steadily during the first decade of desegregation, have been rising steadily since 1978. Black students who study no longer get called “whitey” by other blacks. (In general, after a period in the seventies during which courses like Parenting Today and Search for Self flourished, Hamilton has tightened up its academics.) Grant portrays the racial problems at Hamilton as having been a long, extreme, but discrete convulsion, not a permanent condition.

Still, Grant is profoundly dissatisfied with the state of Hamilton and, by extension, with the state of the American urban public high school. What bothers him the most is the school's continuing inability to regain a “positive ethos.” Hamilton doesn't conceive of itself as a community whose job is to impart values as well as skills and information. The students don't go to assembly. Cheating is widespread. The school drug counselor claims to be unqualified to tell students what's right and wrong. Teachers don't even try to impose discipline, let alone teach students how to live. Hamilton is a bureaucratic, utilitarian institution—people get what they want out of it and move on. Grant longingly compares it with several private and parochial schools that have unabashedly made adolescent character formation a part of their charter.

The conservative preoccupation with moral authority as the key to a happy national life runs deep in Grant. In public schools, he says, authority has moved upstream over a generation, and so been fatally weakened. In the fifties teachers and principals ran schools through the exercise of traditional authority that inhered in their jobs. Then, in the name of achieving various national goals, authority was shifted to the superintendents' offices and the Department of Health and Human Services, which exercise a rational form of authority that revolves around legalistic rules. The corridors of Hamilton High are practically crawling with professional therapists who aren't employed by the principal and who see their role as protecting students from the faculty and administration. Students react to being corrected in class by threatening to sue their teachers. Everything done in schools as part of an effort to "impose a new moral order on the country," Grant says, has had the effect of weakening the moral order in the schools themselves.

It's a measure of Grant's effectiveness that he makes even such troglodytic causes as school prayer, ending federal aid to education, and bringing back corporal punishment (all of which he mentions wistfully but doesn't actually argue for) sound as if they should at least be allowed into the informed debate about education. Where he falls short is where almost every book about social problems, from *How the Other Half Lives* to *Women Who Love Too Much*, falls short: the analysis of what's wrong is much more persuasive than the prescription for fixing it.

ALL THE ACTORS in the story of Hamilton High exercise some emotional claim on Grant, but his heart belongs to the teachers. Again and again he shows them being made the fall guys for social problems they didn't create: it's teachers who have to be the foot soldiers (almost literally—teaching has become more physically hazardous than military service) in the war against racism, teachers who are assigned the task of "mainstreaming" the handicapped, teachers who lose dignity and status when students are given new rights. They have seen their pay and prestige decline steeply, relative to those of other fields, during just the period when the world has dumped so many of its troubles on their shoulders. The success of feminism has effectively drawn off the steady supply of bright

women that teaching used to have. As I read along in *The World We Created*, I began underlining some of the words Grant uses to describe the treatment of teachers: "libel," "condescension," "persecution," "infantilized."

Grant's way to fix the schools is to give all power to the teachers. The superintendents should give control of schools back to the principals—and each school's teachers should essentially be allowed to pick their own principal. Also, teachers should be paid much more ("a top range of remuneration comparable to that of other professionals"), should have their performance reviewed only by other teachers, should not be subjected to competency testing except when they enter the field, should not have merit pay, and should continue to be protected from dismissal. At this late date in the history of our faith in professions Grant is able to call in stentorian, doubt-free tones for "fundamental reforms that could establish the basis of a true profession" in teaching.

A few years ago Ann Grimes and Laura Washington, of the *Chicago Reporter*, did a first-rate series on South Shore High School, in Chicago, another urban public school that deteriorated badly in the sixties and seventies and that, unlike Hamilton, shows few signs of improvement today. Their work showed a terrifying level of teacher incompetence—for instance, an English teacher who misspelled the words *vocabulary* and *tragedies*. Most public-school teachers today come out of teacher's colleges, which are notoriously inferior stepchildren of the higher-education system, with low overall standards and an absurd emphasis on instructional techniques at the expense of the subjects that their students will soon be teaching. In very little time teachers'-college students become tenured teachers, totally protected from consequences if they prove to be no good at their work. It isn't just students who have benefited from the profusion of due-process rights since the fifties; bad teachers are major beneficiaries too.

Grant mentions the teachers'-college problem briefly, but nowhere in his impassioned final chapters is there any hint of anxiety that putting teachers completely in charge of schools might protect bad teachers as well as empower good ones. Also, it isn't clear to me how the kind of authority for which Grant yearns can flow from a group, rather than an individual. The schools he admires

usually have the kind of benevolent-dictator head who will be familiar to readers of affectionate novels about prep schools or newspaper stories about inner-city schools that work. But when the impressively dedicated Grant, who spent years on this book—including one as a teacher at Hamilton High—assembles a group of Hamilton High teachers to begin the work of transforming the school, months appear to pass in meetings to discuss gauzy matters like the necessity of "space for a genuine dialogue." Surely the schools of the fifties didn't have that lazy, summer's-day feeling that any institution run by a committee has.

Because Grant knows what he's talking about so thoroughly, he scatters throughout *The World We Created* small insights about what makes modern-day urban schools work. For example, integration is now a success at Hamilton because today's students have been in integrated schools since kindergarten, and because the city of Median has an all choice school system that lets parent and students pick their school (within the bounds of racial quotas), which forestalls any bitter feelings of coercion. Grant paints integration as a difficult but noble cause; however, the student rights movement, in his account, has done virtually no good and a lot of harm by ensnaring school life in legalism and depriving kids of the discipline the need. Judging from Grant's evidence, should be junked. Paying "master teachers" significantly more—nearby Rochester now has a pay scale that goes up to \$70,000 a year—clearly has an impact on the morale of all teachers. (Grant would give these high salaries on the basis of longevity, not performance.)

The richness of Grant's superb research means that he had the material to produce a nuanced, complicated remedy to schools' problems. Right now the country seems to want, almost desperately, to fix public education, so a truly convincing solution from Grant would have had a lot of influence. It's too bad that he chose instead simply to make an emotional plea in behalf of teachers. Grant points out, it has become a modern American tradition for us to impose on schools sweeping reforms that sound wonderful but don't work. It's hard to believe that handing education over to the teachers as a kind of reparation for their suffering over the past twenty years wouldn't be just another one of the fixes that do more for the national conscience than for the schools. □

RECONSTRUCTION RECONSIDERED

BY JAMES MCPHERSON

THOSE TERRIBLE CARPETBAGGERS
by Richard Current.
Oxford University Press, \$24.95.

RECONSTRUCTION:
America's Unfinished Revolution
by Eric Foner. Harper & Row, \$29.95.

ONCE UPON A TIME the story of Reconstruction after the American Civil War took the form of melodrama. The villains were vindictive radical Republicans. Seeking to aggrandize their power and to humiliate proud but defeated Confederates, they enfranchised freed slaves and loosed a carnival of misrule on the South. Their chief agents in this orgy of corruption were carpetbaggers, those impecunious but shrewd Yankee who traveled southward, carrying their worldly possessions in carpetbags, to squeeze ill-gotten gains from a defeated people. Their allies in pillage were scalawags, poor whites who, hyena-like, joined the Republican Party to pick a few remaining shreds of flesh from the southern carcass. Freed slaves, runk with rights and privileges they either understood nor deserved, functioned as the dupes of cynical carpetbaggers who manipulated their votes to ravish the prostrate South.

After a decade of intolerable exploitation, southerners (defined as white Democrats) rose in righteous wrath to throw off the rule of their oppressors, recognizing the mistake of having tried to elevate black semi-savages over the power of white civilization, the North acquiesced in this denouement, in 1877, withdrawing federal troops from the erstwhile southern state capitals, where they had been the only force propping up the remaining "Negro-Carpetbag" governments. The prophet of this redemption (whites called it) was Andrew Johnson, who as President from 1865 to 1869 had tried in vain to resist the radical juggernaut, suffering impeachment and conviction for his pains. The heroes were former Confederates like Wade Hampton, of South Carolina, and Q.C. Lamar, of Mississippi, who led the South out of the wilderness of Reconstruction, aided by the saintly warriors of the Ku Klux Klan.

This was the version of Reconstruction popularized by D. W. Griffith's classic 1915 movie *Birth of a Nation* and by Claude Bowers's best-selling 1929 book *The Tragic Era*. It persisted in books with such titles as *The Dreadful Decade* and *The Age of Hate*. Dissenters occasionally spoke up—chiefly black people and white liberals who thought their ancestors had fought a war for national survival and freedom and had carried out a reconstruction to preserve the fruits of that war. In the 1930s a few revisionist historians began to challenge the traditional version of Reconstruction with a more balanced and less racist interpretation. But the old orthodoxy prevailed until at least the 1950s. It received the imprimatur of the authoritative History of the South series, whose 1947 volume *The South During Reconstruction* declared that "no amount of revision can write away the grievous mistakes made in this abnormal period of American history," which witnessed "the blackout of honest government." In the 1950s the leading college textbook on Reconstruction described the era as "a time of party abuse, of corruption, of vindictive bigotry." The foremost general textbook on American history, widely used in both college and high school, deplored the "gun-supported reconstruction of the South, begun so brutally in 1867," which produced southern state governments that "resembled the comic opera."

Such views were not confined to the classroom. The *New York Times* pundit James Reston characterized the Reconstruction policy of Negro suffrage as "vicious," and Drew Pearson lamented the "excesses" of "Negro extremists" during Reconstruction which had alienated their southern white friends and "set back Negro progress by half a century." And in his best-selling *Profiles in Courage*, Senator John F. Kennedy condemned Republican "extremists" who made the period "a black nightmare the South could never forget," bringing on "years of Southern bondage and exploitation" before "the South could regain her dignity and her rightful place in the nation." A few years after the publication of *Profiles in Courage*, southern politicians and editors used similar language to denounce Kennedy's dispatch of federal marshals and troops to the South on precisely the same mission those Republican "extremists" had tried to accomplish a century earlier: the enforcement of national supremacy and constitutional rights.

THE CIVIL-RIGHTS movement not only transformed America in the 1960s; it also helped transform attitudes toward Reconstruction. Historians do not merely recount the "facts" of the past. Rather, they try to interpret the meaning of those facts. And that endeavor is inevitably conditioned by the perspective of the historian's present. Anyone who sympathized with the quest of blacks for equal rights in the 1960s—as most historians did—was likely to view black people rather than southern whites as having been the victims of "bondage and exploitation" a century earlier, and to regard Reconstruction not as a denial to the white South of "her dignity and her rightful place in the nation" but as an attempt to help blacks obtain theirs. The idealism and achievements of the "second Reconstruction" in the 1960s prompted intensive re-examination of the first, whose civil-rights laws and voting-rights acts anticipated those of 1964 and 1965 by a century, and whose enactment of the Fourteenth and Fifteenth amendments provided the constitutional basis for whatever progress this country has been able to make toward a color-blind polity.

The earlier ripple of revisionism thus became a tidal wave that capsize the traditional view of Reconstruction. Instead of vindictive villains, radical Republicans became champions of racial justice. Instead of contemptible traitors, scalawags became courageous dissenters from southern white-supremacy orthodoxy. Instead of bayonet-wielding oppressors of southern whites, federal troops and marshals became protectors of blacks. Instead of ignorant pawns of northern exploiters, black voters became a liberated people struggling upward toward freedom and a decent life. Instead of an honored prophet, President Andrew Johnson became a despised racist.

Even the carpetbaggers underwent a remarkable metamorphosis. Though some of the northerners who moved south after the Civil War and eventually went into politics as Republicans may have merited the typical southern description of them as "depraved, dissolute, dishonest . . . itinerant adventurers," most did not. No historian has done more to rehabilitate their reputation than Richard Current, whose first book, ironically, was a biography of the radical leader Thaddeus Stevens which fit the traditionalist mold. But that was

nearly half a century ago. The latest of Current's eighteen books, *Those Terrible Carpetbaggers*, culminates years of research on the carpetbaggers which has been intended to illuminate the "human beings hidden behind the stereotype." It succeeds brilliantly through biographies of ten of the most prominent (and in southern eyes notorious) Yankees who settled in the South after the war, interweaving the stories of their careers in a narrative of Reconstruction in the seven states where they lived.

Six of these men were state governors, four were United States senators (two of these served also as governors), one was a state judge, and one a county sheriff. Were they mostly "ignorant and illiterate," as a North Carolina college student wrote a few years ago? Seven of the ten had a college education (at a time when less than two percent of Americans had attended college); the other three were two lawyers and a newspaper editor. Four of the ten wrote books; another held a Phi Beta Kappa key and degrees from both Harvard and Yale. Nor was this untypical of carpetbaggers: in general, they may have been the best-educated group in American politics. Were they soldiers of fortune, penniless itinerants on the make who came south because they were too "degraded to get the lowest of places in the states they had just left," as a southerner has described them? They were soldiers, to be sure: nine of the ten had served as Union army officers. But they were hardly obscure or incompetent. All had fine war records, four were promoted to the rank of general, four had been wounded, and one had won the Congressional Medal of Honor. Nor was this untypical: fifty-two of sixty carpetbaggers who served in Congress were Union army veterans. Nearly two thirds of this larger sample had practiced a profession—law, medicine, engineering, or teaching—and many of them had also become involved in business or farming in the South. They brought not skimpy carpetbags but, rather, considerable capital to invest in what they hoped would become a new and better South. Indeed, it is likely that the carpetbaggers brought more money into the South than they took out. As a group, they were no more venal than was average for Americans in politics during that era. Their unsavory reputation, Current writes, was largely a product of "the Democrats' propaganda technique of the Big Lie."

But did not the carpetbaggers come

"out of the North to use the negroes as tools for their own selfish ends," as Woodrow Wilson charged? It is quite true that they supported equal civil and political rights for the freedmen. However, most came south with little or no intention of seeking political office. They were officers in the Union occupation forces who stayed on after their discharge, or agents of the Freedmen's Bureau (a government agency to help ex-slaves make the transition to freedom), or teachers in black schools established by northern missionary societies, or investors in plantations growing cotton with free labor. Many settled in the postwar South for the same reason that others went west: they were seeking a new frontier in which to invest their capital and energy. It was an opportunity to rebuild a shattered economy and construct a new society based on freedom—and of course to get ahead themselves. They went into politics only when it became clear that these goals could not be achieved without the vigorous leadership of Republican state governments to preserve the principles of nationalism and freedom that they had fought for as soldiers.

In effect, Reconstruction became a continuation of the Civil War, with carpetbaggers being officers in government as they had once been officers in the army. "The war still exists in a very important phase here," Adelbert Ames, a Maine native and Medal of Honor winner, wrote in 1869 from Mississippi, where he became a senator and then governor. Nor was their new role as politicians notably more peaceful than their old one as soldiers. Confederate veterans organized the Ku Klux Klan and other paramilitary groups to fight Republican governments sustained by Yankees as they had fought the Yankee army a few years earlier. This time they won, killing hundreds of blacks and scores of carpetbaggers and scalwags in the process. Southern whites overthrew Reconstruction and restored "home rule" (government by white Democrats) with the most relentless and large-scale terrorism in American history. They succeeded because whereas the North had been willing to pour two million soldiers into the South to preserve the Union, it was unwilling to pour in the resources necessary to preserve radical Reconstruction.

AND RECONSTRUCTION *was* radical, according to *Reconstruction: America's Unfinished Revolution*, Eric Foner's volume in the New American Nation Se-

ries. Indeed it was a revolution, though the success of the southern counterrevolution made it an unfinished one.

The revolutionary nature of the Civil War and Reconstruction would seem self-evident: they not only emancipated four million slaves (at a cost of at least 620,000 lives) but also granted those slaves civil and political equality with their former masters and elevated a number of them to political office within three years of their emancipation. Contemporary observers certainly perceived this as a revolution. British and French journalists reporting from the United States during the 1860s described Emancipation and Reconstruction as a "mighty revolution" and "one of the most radical revolutions known in history." Thaddeus Stevens, they told European readers, was the "Robespierre" of "the second American Revolution." None other than Karl Marx wrote extensively about the "world transforming . . . revolutionary movement" going on in the United States. A northern journalist, visiting the South a decade after the war, wrote, "I do not believe that the ruin of the French nobility at the first Revolution was more complete than . . . that of the proud, rich, and cultivated aristocracy of the low country of South Carolina, where former slaves now owned considerable land and held most of the government offices. Speaking in behalf of the Civil Rights Act of 1866, which granted ex-slaves equal citizenship and empowered federal courts to enforce civil rights, a senator from Maine conceded that "this species of legislation is absolutely revolutionary." He went on, "But are we not in the midst of revolution?"

Revisionist historians in the 1960s accepted the notion of Reconstruction as a revolution, and praised its achievements. Some of them believed that it was not revolutionary enough; in particular they regretted that Thaddeus Stevens's proposal to confiscate the land of wealthy "traitors" (Confederates) and grant it in forty-acre plots to the free slaves was never adopted. Without the basis of economic independence that this might have provided them, the largely landless ex-slaves were vulnerable to the white counterrevolution that swept away many of their civil and political rights. Without land reform one revisionist scholar wrote in 1966 "Reconstruction was a revolutionary *manqué*."

It was but a step from this assertion

a belief that Reconstruction was no revolution at all. By the 1970s a number of "post-revisionist" historians had taken precisely this position. Post-revisionism grew up in the climate of disillusionment with American institutions produced by the Vietnam War and the aftermath of the civil-rights movement. If capitalist democracy produces imperialism and napalm bombing in Southeast Asia, if civil-rights and voting-rights acts leave the masses of black Americans impoverished in urban ghettos, what good are they? Such was the question asked by a growing number of white radicals and black militants.

Several historians who asked these questions about contemporary America began taking a hard look at Reconstruction. Not surprisingly, they found that whereas northern Republicans had enacted civil-rights laws in the 1860s and 1870s, these lawmakers represented racist constituencies who cared little about black equality per se and watched with indifference, or satisfaction, when the rights were taken away; that although ex-slaves did vote in large numbers for a few years, they remained impoverished sharecroppers on land owned by their former masters, whose economic dominance was never interrupted and whose political dominance quickly recovered. In this post-revisionist view the Freedmen's Bureau became not the coddler of lazy blacks portrayed by traditionalists or the protector of exploited freedmen pictured by revisionists but an agency to get ex-slaves back to work on terms favorable to landlords. Even one of Reconstruction's proudest achievements—the creation from scratch of public-school systems for blacks (and indeed in some localities for whites as well), appraised by teacher-training academies and colleges supported by northern philanthropy—became in post-revisionist eyes merely an instrument for the social control of black workers by the inculcation of docility and decorum. Thus, as one post-revisionist phrased it, the Civil War and Reconstruction produced no fundamental changes in the "antebellum forms of economic and social organization in the South." No real revolution took place because the abolition of slavery caused no "specific changes in the status of the former slaves or in the conditions under which they lived."

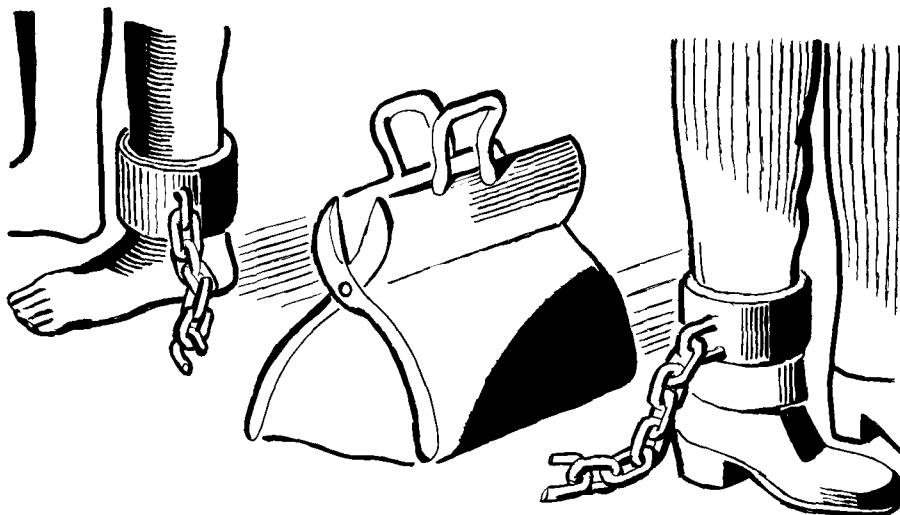
As a school of Reconstruction historiography, post-revisionism has lasted a longer time than did Reconstruction it-

self. The thesis that the Civil War, this country's largest and most violent upheaval, caused no significant change lacks credibility. Eric Foner's rich, complex, exhaustive study gives post-revisionism the *coup de grâce*. Reconstruction constituted a "dialectic of continuity and change," he maintains, and we must not lose sight of the importance of the change. Foner's thesis is all the more persuasive because he came to intellectual maturity during the Vietnam era and shares many cultural values and theoretical viewpoints with the post-revisionists. But his disappointment with the documented shortcomings of Reconstruction is tempered by an appreciation of the difficulties it faced and the successes it achieved.

Foner agrees with post-revisionists that the problem of labor relations be-

southern state and local governments, they could largely protect the legal rights and economic welfare of those constituents.

No other society that abolished Afro-American slavery granted freedmen equal political rights. The uniqueness of Reconstruction in the United States stemmed from the Republicans' free-labor ideology—a belief in equal opportunity for all men to move up as fast and far as they were capable of in a free-enterprise economy. But this ideology carried the seeds of its own failure. In the world of giant corporations, permanent wage-earners, and growing agricultural tenantry which emerged after the war—the America of the Gilded Age—the notion of equal economic opportunity for the poor became an ideology of conservatism rather than the radicalism



tween former planters and former slaves was the central issue of Reconstruction. But rather than seeing continuity from slavery to sharecropping, he subtly analyzes the dialectic between landowners who wanted to restore gang labor under white supervision, and freedmen who wanted autonomy as independent farmers. The result was tenantry and sharecropping, which allowed freedmen some autonomy and a higher standard of living than they had known as slaves. Drawing on a rich body of recent scholarship on post-Civil War southern agriculture, Foner shows how an oppressive credit system and the restoration of political control by landlords in the 1870s turned sharecropping into a powerful engine of poverty and stagnation. But this is precisely the point that illustrates the radicalism of the brief Reconstruction interlude. As long as Republicans with a largely black constituency controlled

that it had represented in the antebellum era. It ultimately weakened the northern commitment to federal intervention to uphold "Negro-Carpetbag" state governments in the face of counter-revolutionary terror.

The success of this counterrevolution, however, confirms the revolutionary dimension of Reconstruction. "It is a measure of how far change had progressed," Foner writes, "that the reaction against Reconstruction proved so extreme." And though largely a failure in the end, Reconstruction left some positive legacies in the form of black educational and social institutions, a tradition of black activism, and constitutional amendments that helped ensure that U.S. race relations would not go in the direction South Africa's have taken and that provided the legal framework for the second Reconstruction of the 1960s. □

BRIEF REVIEWS



SOVIET AGRICULTURE by Zhores A. Medvedev. Norton, \$27.50. Mr. Medvedev, a biochemist exiled from the Soviet Union for his outspoken opposition to, among other matters, the now discredited theories of Lysenko, has made a chronological study of agriculture under the Communist regime. Some of the text is technical enough to bewilder anyone but an agronomist, but the story as a whole is a perfectly comprehensible record of failure. Regardless of government policy (which has changed with every change of leadership), five- and ten-year plans, quotas, cruelty to farmers or pampering of same, proliferation of officials, and staggering expenditures of money, Soviet agriculture has gone steadily downhill. Mr. Medvedev reports of one aspect of the system that it suffers from "poor planning, incomplete mechanization, lack of transport facilities and general mismanagement or, as it is called in Russian, *bezkhoyzaistvennost'* (a word which defies translation, since it includes poor and shoddy work as well as poor coordination between different branches of the economy)." That astounding word can actually be applied, given Mr. Medvedev's analysis, to all of Soviet agriculture, and while it defies exact translation into English, we have a reasonable vernacular equivalent in *snafu*. What Mr. Medvedev describes in this highly interesting book is *snafu* so complete and chronic that it would be funny if it were not so obviously dangerous to both the Soviet Union and the rest of the world.

S. by John Updike. Knopf, \$17.95. Mr. Updike's latest novel is an acid comedy of illusions and delusions told entirely in the words of a woman who is both deceived and deceiver. Sara is that currently fashionable heroine, the middle-aged matron who flees luxury and a boring husband to find freedom or her true self or, in Sara's case, spiritual enlightenment at an ashram somewhere in Arizona. Liberation from the gross material world is what she has in mind, but as a

proper New Englander she pursues that goal with moderation. She stows her family silver out of her husband's reach and does not overlook the joint bank account. Mr. Updike has been ingenious and amusing in revealing the actuality of the ashram through the enthusiastic burlings of a newcomer who does not understand what is going on around her, and he has evidently enjoyed boning up on Oriental mysticism. He has even provided a glossary, from *abhayamudra* to *yuganaddha*, for readers afflicted with avidya. What he has not provided is any convincing reason to consider Sara a modern equivalent of Hester Prynne, of *The Scarlet Letter*, although he certainly wishes her to be seen in that character. Now, why should Mr. Updike cling to Hawthorne's coattails?

THE BLIZZARD OF '88 by Mary Cable. Atheneum, \$19.95. In 1888 the adolescent United States Weather Service assumed that the Lord would not permit untoward events on His day. The outfit closed down at midnight on Saturday and remained virtually comatose until five o'clock on Sunday afternoon, so when a cold blast from the west joined a northbound hurricane on Sunday, March 11, nobody could report hell to pay off Cape Hatteras. By Monday morning the storm had reached New York City, where those who endured the fierce winds and savage cold never forgot it. Survivors even formed a club, like war veterans, and held annual luncheons to exchange memories. It seems likely that Ms. Cable has had access to records of that club, for her account of the great blizzard abounds in lively personal anecdotes of adventure and resourcefulness. The storm was not without its useful side. It got the tangle of telegraph, telephone, and electric wires (illegal for years) out of the streets and stimulated action on the long-needed subway system. It also demonstrated how quickly and easily natural disaster can put a mechanized society—New York was already in essence a twentieth-century city—out of action. For that reason alone the blizzard of '88 is still of interest.

UNCOVERING SOVIET DISASTERS by James E. Oberg. Random House, \$19.95. Mr. Oberg points out that Soviet editors tend to see national news as a "morality play," requiring some element of heroism or achievement to be worth printing. That view partly explains the tradi-

tional Soviet reluctance to report such events as plane crashes, ship sinkings, train wrecks, and nuclear accidents, all of which, according to his careful study, have been far more numerous than has ever been acknowledged. Soviet secretiveness is of course generally recognized, but the examples Mr. Oberg has collected of what in the corrupt capitalist West would be considered disgraceful cover-ups are fascinating both for their number and for their occasional folly. The Soviets appear not to have noticed that a mistake that goes unreported is likely to be repeated. Mr. Oberg takes note of recent relaxations in the non-information policy, and is inclined to attribute them more to improved spy satellites than to any change of heart in the Kremlin.

LETTERS FROM AMERICA by Rupert Brooke. Beaufort Books, \$16.95. In 1913 Brooke, already a poet of some reputation, set out to see the world, beginning with the United States and Canada. The travel pieces that he sent back to England have not before appeared here and one can see why, for barring a few periodic details, they are thin stuff. The preface by Henry James can only be described as embarrassing.

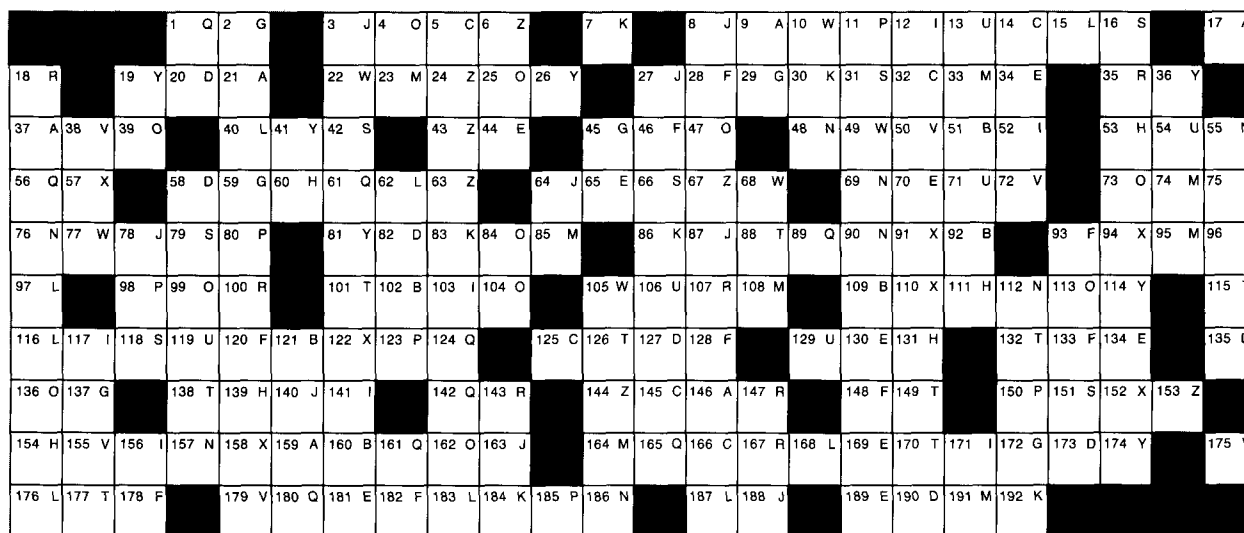
ANTHILLS OF THE SAVANNAH by Chinua Achebe. Doubleday, \$16.95. Mr. Achebe's vivid and impressive novel is set in the imaginary West African state of Kangan, which is suffering all the problems of unfamiliar independence compounded by a savage drought in a northern province. A corrupt civilian government has been ousted by a military coup, leading to the installation of Sandhurst-trained officer as President for life. His Excellency is mightily worried because that northern province did not support his election, and he blame two old friends and allies, also European-educated, for the unsatisfactory vote. The friends, a languid Commissioner of Information and a crusading editor, watch helplessly as good old Sam degenerate into a paranoid and violent dictator. The tragic tale is clearly based on the author's Nigerian background, but it is enlivened by ironic wit, African folklore, poetry, and Kangan's ingenious transmogrification of English. It also arrives at a cautiously optimistic conclusion, implying that the gap between indigenous standards and imported ideas can, with patience and good will, be bridged.

—Phoebe-Lou Adan

ACROSTIC No. 33

BY DOROTHY OSBORNE

The letters of clue answers, when put in the appropriately numbered squares, will spell out a quotation. The first letters of clue answers spell the author and source of the quotation.



The solution to Acrostic No. 32 appears on page 69.

A. Indian confederation also known as Sioux 21 9 159 17 37 146

B. Building with triangular walls (hyph.) 102 109 121 160 92 51

C. Four-armed god of Hinduism 5 32 125 145 166 14

D. Out of good graces (2 wds.) 58 127 20 190 135 173 82

E. Birdbrain (hyph.) 189 70 44 181 169 134 65 130 34

F. Bebop pianist: 1924-1966 (2 wds.) 93 46 128 178 120 148 182 133 28

G. Nymph whom Paris deserted for Helen 29 2 172 45 59 137

H. "Tread softly because you tread on my —" (Yeats) 131 154 139 111 53 60

I. Klutzy (2 wds.) 171 103 75 141 12 117 156 96 52

J. Bulletin (2 wds.) 78 163 8 140 27 64 87 188 3

K. Site of Cornell University 83 192 184 30 86 7

L. Legendary creature of the Pacific Northwest 15 40 97 116 176 187 183 62 168

M. Poet laureate of Victorian England 23 74 108 33 85 191 95 164

N. Feat of scoring in hockey (2 wds.) 48 157 69 76 186 90 55 112

O. Swiss cheese 39 25 73 99 84 104 136 4 162
113 47

P. Go back and forth 98 11 185 80 123 150

Q. James Alan McPherson's Pulitzer Prize-winning work (2 wds.) 61 124 161 180 1 56 165 142 89

R. Mean and wicked man 167 100 35 147 107 18 143

S. Syncopated piano music 42 118 79 31 151 66 16

T. Object of Quasimodo's devotion 149 101 177 115 138 126 170 88 132

U. Vehicle drawn by three horses 119 71 13 54 106 129

V. Burgonet or morion 38 72 175 50 155 179

W. Egyptian god of the underworld 49 68 22 10 77 105

X. Painter of Parisian scenes 91 152 158 122 110 94 57

Y. Period of activity 26 174 81 114 41 19 36

Z. Author of *Charlotte's Web* (3 wds.) 6 67 144 153 43 63 24

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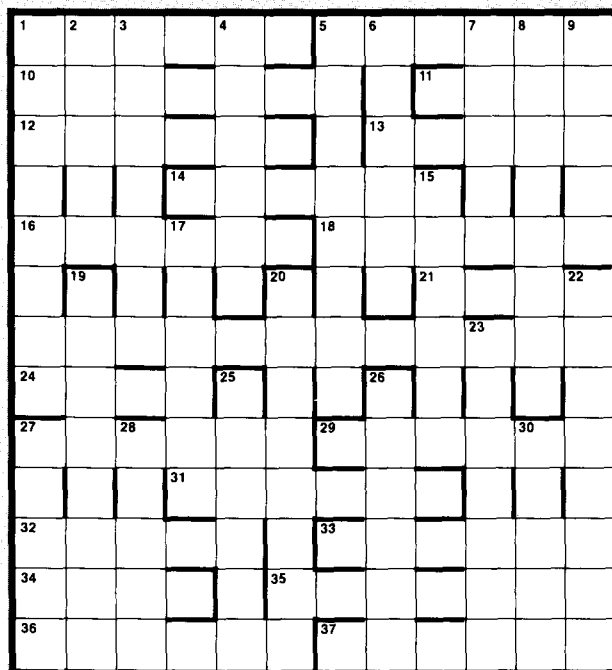
THE PUZZLER

BY EMILY COX AND HENRY RATHVON

MAGIC

Some of the answers to this puzzle's clues involve a magic trick, which is identified by the central Across entry in the diagram. Clue answers include five proper nouns; all other words except 8 Down (a common phrase not in most dictionaries) can be found in *Webster's Ninth New Collegiate Dictionary*.

The answers to last month's Puzzler appear on page 69.



ACROSS

1. When garbage truck driver goes in reverse, there's a need for surgery (9)
5. English monarch fighting in endless swirl (6)
8. Coming to peer behind a teacher's back (7)
11. Between terminals, tramps wind (4)
12. Head decorator recalled medical assistance (6)
14. Piece with mushrooms in the middle eaten by group (8)
16. Products of static far off (9)
18. Folks from Indiana laugh off willow rods (6)
20. Monks in conversation with some nosy folks (6)
22. Tide penetrates dune, apparently (4)
24. Fungal growth most of the way hence (4)
26. Rocks to the start of salsa sounds (6)
28. Clergyman gets over love affair's ending (6)

31. God is beginning to sit a spell (6)
32. Clobber cat, brain camel (8)
33. Chained outside, chopper got ready for takeoff (6)
34. Campus military group with cunning overturned vehicle (7)
35. Unruly brother caught in place of priest (10)
36. Hotshot's housing *Hair* performers (9)
37. Left incense back of a monarch (6)

DOWN

1. Hot and bothered, I vacated Rio (11)
2. Indians most truly topless and bottomless (5)
3. Oxford pamphleteer misspelled "Antarctica," using an "r" for a "c" (10)
4. Make *Much Ado About Nothing* creator mad about 1/3 of verses (9)
5. Obscure quote about medicine brought up (8)

6. During days, snarled traffic makes light change? (9)
7. A command initially enraged bear (5)
8. Frame OK for car! (8) (*two words*)
9. Study Eliot's depressions (5)
15. Creates music about the last of George Burns (6)
17. Leave me out of income taxes when rearranging fees (9)
19. Wander into Section E in ornamental garden (8)
20. Con men—timid sorts? (8)
22. Ineptly protect lady from reptile (11)
23. Pull raincoat out about two times (10)
25. Spirited meeting among these ancestors (6)
26. Inside dining spot, a red wine holder (6)
27. Take away hoagie, returning pie with key inside (8)
28. Around middle of musical, lead up to medleys (5)
30. After love, each one works (5)

te: The instructions above are for this month's puzzle only. It is assumed that you know how to decipher clues. For a complete introduction to clue-solving, send an addressed, stamped envelope to The Atlantic Puzzler, 8 Arlington Street, Boston, Mass. 02116.

WORD WATCH

BY ANNE H. SOUKHANOV

playtza *noun*, a method of body toning and relaxation in which a person is beaten gently with oak leaves and then usually takes a few minutes of steam followed by a sauna: "After a Turkish bath, have any remaining cares driven away by a Shiatsu massage, a Swiss needle shower, or the Bulgarian oak *playtza*" (*Business Week*).

BACKGROUND: Here is a retrospective on a word that appeared in this column in March of 1987. At the time, we said that the background of *playtza* was "obscure" and that the context of the single citation in our files suggested the possibility of a Bulgarian connection. A number of readers subsequently suggested that *playtza* comes from a Yiddish word meaning variously "shoulder," "the shoulders," "the upper back." Several others suggested Polish and Russian etymologies. We asked Marvin Herzog, a professor of Yiddish studies and linguistics at Columbia University and the editor-in-chief of *The Great Dictionary of the Yiddish Language*, to adjudicate the matter. Here is his response:

"The word *playtza* is surely derived directly from Yiddish *pleytse*—'back,' 'shoulder.' The Yiddish word, in turn, is derived from the Polish plural form *plecy*, meaning i) 'back,' 'shoulders,' and ii) 'protection' (i.e., 'pull') and 'patronage.'

"What of possible Slavic sources other than Polish? Most, or perhaps all, of the Slavic languages have a form cognate with Polish *plecy*. They are all presumed to derive from the reconstructed Common Slavic **pletje*. Nevertheless, Bulgarian is the least likely source of Slavic influence on Yiddish and an unlikely source of the word in English, as well. Russian influence on Yiddish is relatively late and really quite meager. It's no rival for Polish.

"The Yiddish expression *untershteln a pleytse* means 'to lend a hand.' I'm pleased to have been able to do that in this case."

Here are a few of the words being tracked by the editors of The American Heritage Dictionary, published by Houghton Mifflin. A new word that exhibits sustained use may eventually make its way into the dictionary. The information below represents the first stage of research, not the final product.

serious *adjective*, of such quality as to appeal to the expert, the connoisseur, or the sophisticate: "Every *serious* kitchen needs at least one peppermill" (*Washington Post*).

BACKGROUND: According to Geoffrey Nunberg, a professor of linguistics at Stanford University and the chairman of the *American Heritage Dictionary* Usage Panel, "The original source of the new use of *serious* was doubtless in the phrase *serious money*, but by now it's been extended to all of the things serious money can buy." Some of these things are, according to our citations, *serious* make-up and accessories, a *serious* pizza, a *serious* body, even *serious* fun. *Advertising Age* has pointed out that cars such as the Datsun 280ZX and the Mazda RX-7/GSL-SE, identified by numbers and letters rather than by model names, are "Serious Cars Designed by Serious Engineers

(SC-DSE)." Nunberg believes that words like *serious* and *world class* are "the accolades of a generation who pride themselves first and foremost on being discriminating consumers."

snide *noun*, a slyly disparaging character, tone, or outlook: "'Of course,' says Dorothy Sarnoff, an image consultant in New York, . . . 'I changed him [Senator Robert Dole]. He was the best student I ever had. A nice, nice man. I took away his *snide*'" (*Life*).

BACKGROUND: *The Oxford English Dictionary* records the noun use of *snide* as far back as 1885, when it meant "counterfeit jewelry; a base coin." Other senses, meaning variously "a swindler, cheat, or liar" and "hypocrisy; pretense; malicious gossip," go back to 1874 and 1902, respectively. The process of "functional shift" from adjective to noun is discussed at

some length by Hans Marchand in his book *The Categories and Types of Present-Day English. Word-Formation*. Marchand explains that most such change involve elliptical construction where the substantive (noun) is absent but can always be readily supplied, as in *advisory* (a *advisory report*), *facial* (a *facial treatment*), *spectacular* (a *spectacular performance*, *show*, *program*), *local* (a *local resident* and *hopeful* (a *hopeful candidate*). Marchand points out that "some of these elliptical expressions have gained complete independence . . . , as is the case with *musical*. The word is no longer thought of as a shortening of *musical comedy* but has become a substantive in its own right." Still other examples called "de-adjectivals" by Randolph Quirk, are *natural*, *final*, *regular*, *comic*, *roast*, *perennial*, *annual*, *monthly*, *weekly*, and *daily*. Sarnoff's use of *snide* is equivalent to the use of the noun *cool* in the sentence "Don't lose your *cool*."

tree hugger *noun*, a job seeker who has been employed by one company for his or her entire career and who is regarded as disadvantaged because prospective employers do not prefer candidates with multifaceted experience at a number of firms: "This poor bloke is a *tree hugger*. In another time, of course, what the *tree hugger* resented was known—and valued—as loyalty" (*Sales & Marketing Management*).

BACKGROUND: This new sense of *tree hugger* (it has an older sense, denoting a radical environmentalist) reflects a changed view in the employment marketplace. Job-hopping, once considered highly detrimental to career advancement, is now being encouraged by the headhunters: "A . . . *tree hugger* . . . is increasingly seen as narrow in experience and someone who's fearful of the unknown," says Jacques I. Pointe, the president of Recruiters International, Inc. (*Christian Science Monitor*).

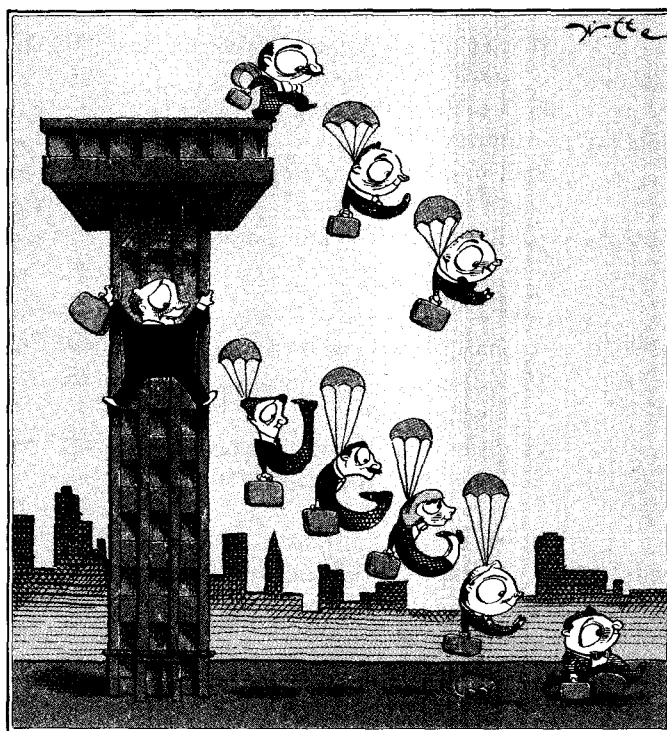


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